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MASSACHUSETTS

Cheese Manufacturers Association,

ANNUAL REPORT

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FIRST ANNUAL REPORT

OF THE

MASSACHUSETTS

Cheese Manufacturers Association,

FOR THE YEAR 1865.

SOUTHBRIDGE :
JOURNAL OFFICE, PRINTED BY H. C. GRAY.
1866.

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R E P O R T .

In submitting the first annual report of the Massachusetts Cheese Manufacturers Association, we regret that we are not able to give to its members a fuller report of the doings of the several cheese factories that were in operation the past year. In April, 1864, the first cheese factory in Massachusetts went into operation. In the State of New York they had become numerous, and it was found to be a great economy of labor, besides being more remunerative.

With many farmers in Massachusetts, there seemed to be a demand for some mode of managing the dairy that would be less perplexing, and, at the same time, more remunerative, than sending milk to market, or manufacturing cheese by single dairies. We need economy of labor as much in the management of the dairy, as in the manufacture of cotton or woollen goods, or in the improved modes of managing the farm. Not only do we find economy of labor, but a more uniform article is produced, which finds a readier sale in our markets for home consumption as well as the foreign demand. In the manufacture of cheese in families, many hands are employed to do an amount of labor which can be performed with greater ease by a small number.

Not far back in the past was wool and flax spun and woven in families. Can they afford to do it now? So with the cheese factory, if well managed families can not afford to make cheese at home. Is it the part of wisdom, then, to retain the old method of cheese-making? Heretofore, each dairyman, or rather dairywoman, has relied almost entirely upon their own skill in developing the art or science of cheese-making, having no fixed rule for the various processes until the cheese finally reaches the consumer.

By the formation of associations, and meetings for discussions, and reports from the various factories, we can mutually aid each other, and thereby bring the art of cheese making to a greater degree of perfection.

Under a call signed by Dwight Ellis, of Warren, and others, a meeting was held at West Brookfield, on Thursday, February 9th, 1865, at which reports were made from five cheese factories, which had gone into operation during the year, viz: South Adams, Barre, Blanford, West Brookfield, Hardwick Center and Warren. We learned, also, that another factory went into operation during the year in the south part of Hardwick, although there was no further report from it. The condensing factory at West Brookfield reported that cheese was made a part of the year, but did not report how much. Blanford also did not report the amount of cheese made. South Adams, Barre, Hardwick and Warren, reported that 364,178 pounds of cheese were made during the season of 1864, and the net price was \$19.60 per hundred pounds. The above factories reported that they received the milk of 1,355 cows.

At the meeting held February 9th, 1864, it was deemed wise and expedient to form an Association, through which might be gathered and disseminated the practical experience of the dairying community. Such an Association was formed, with Dwight Ellis, of Warren, for its President. The first annual meeting of the Association since its organization, was held at the Town Hall, in West Brookfield, on Thursday, February 1st, 1866, and was very fully attended, evincing an interest in this branch of dairying. It is to be regretted that some factories failed entirely of making any report showing what they had accomplished during the year.

It is desirable and important that every factory should make as full a report as possible of its doings during the year, so that we may gather from them all the facts interesting to a dairying community. Circulars have been prepared and sent to the several factories to aid in getting as uniform a report as possible. We hope no one will fail to have them filled out as requested by the Executive Committee. During the year 1865, eleven factories were in operation; some of them, however, only a short time. West Brookfield factory is for condensing milk, and made cheese only when they had a surplus of milk for their regular condensing business, and made no report on cheese. Westboro reported that they made cheese only twenty-seven days, and gave no further report. Hardwick South, although importuned, have not as yet reported.

The list of factories for 1865 is as follows: Barre Central, Barre South, Blanford, New Braintree, Hardwick Center, Hardwick South, Petersham, Westboro and Warren.

We give reports of them as far as they have been submitted.

N. S. HUBBARD, *Secretary.*

BRIEFIELD, May, 1866.

OFFICERS OF THE ASSOCIATION FOR 1866.

PRESIDENT:

HOLLIS TIDD, OF NEW BRAINTREE.

VICE PRESIDENTS:

T. P. ROOT, of Barre, | S. L. LINCOLN, of South Adams.

SECRETARY:

N. S. HUBBARD, of Brimfield.

TREASURER:

B. F. HAMILTON, of New Braintree.

EXECUTIVE COMMITTEE:

HOLLIS TIDD, of New Braintree,	N. S. HUBBARD, of Brimfield.
T. P. ROOT, of Barre,	B. F. HAMILTON, of New Braintree.
S. L. LINCOLN, of South Adams,	

PREAMBLE AND CONSTITUTION

OF THE MASSACHUSETTS CHEESE MANUFACTURERS ASSOCIATION.

PREAMBLE.

Whereas, it is deemed expedient to organize an Association, through which as a medium, results of the practical experience of dairymen may be gathered, and disseminated to the dairying community, therefore,

Resolved, That we do hereby associate ourselves together for mutual improvement in the art and science of cheese making, and more efficient action in promoting the general interests of the dairying community.

CONSTITUTION.

ARTICLE I. The name of the organization shall be the MASSACHUSETTS CHEESE MANUFACTURERS ASSOCIATION.

ARTICLE II. The officers of the Association shall consist of a President, two Vice Presidents, Secretary, and Treasurer.

ARTICLE III. The President, Vice Presidents, Secretary and Treasurer shall constitute the Executive Board of the Association.

ARTICLE IV. The officers of the Association shall be elected at the regular annual meeting, and shall retain their offices until their successors are chosen.

ARTICLE V. The regular annual meeting shall occur on the third Thursday in February of each year, and at such place as the Executive Board shall designate.

ARTICLE VI. Any person may become a member of the Association, and be entitled to all its benefits, by the annual payment of one dollar.

LIST OF MEMBERS.

BARRE.

L. Adams,
A. H. Holland,
J. T. Ellsworth,

T. P. Root.
James S. Davis,
Peter Harwood,

Francis D. Rice,
E. P. Haynes,
W. R. Bassett.

BRIMFIELD.

N. S. Hubbard,

A. Homer,

G. F. Brown.

BLANFORD.

E. W. Boise.

BOSTON.

W. K. Lewis.

COLDBROOK.

W. R. Whiting.

HARDWICK.

J. W. Powers,

R. S. Ruggles,

J. M. Robinson.

NEW BRAINTREE.

B. F. Hamilton,
Hollis Tidd,

M. Pollard.
Dwight G. Burn.

C. S. Tidd.
J. M. Greene.

PETERSHAM.

D. C. Paige.

SOUTH ADAMS.

S. L. Lincoln.

WESTBORO.

G. H. Raymond.

WEST BROOKFIELD.

E. B. Lynd,
E. Fairbanks,
J. G. Bruce,

J. W. Bailey,
O. A. Davis,
J. Henshaw,

S. N. White,
E. A. Henshaw.
J. W. Adams, Jr.

WARREN.

Dwight Ellis.

D. S. Ellis.

REPORTS.

BARRE CENTRAL CHEESE COMPANY, 1865.

Commenced making cheese June 13th, closed October 26th.

Amount of milk received, 783,652 lbs. ; amount of cheese manufactured, 82,389 lbs. ; one pound of cured cheese to 9½ pounds of milk.

Cost of labor in manufacturing, per 100 lbs.,	-	-	-	-	0.76
Cost of material per 100 lbs.,	-	-	-	-	0.39

Manufacturing and materials per 100 lbs.,	-	-	-	-	\$1 15
Gross amount of sales of cheese,	-	-	-	-	\$14,526 00
Average gross sales per 100 lbs.,	-	-	-	-	\$17 63
Net sales of cheese,	-	-	-	-	\$13,895 56
Average net sales per 100 lbs.,	-	-	-	-	\$167 44
Net sales after deducting sales and commission, per 100 lbs.,	-	-	-	-	\$14 444
Whole expense of freight, commission, boxes, labor and manufacturing per 100 lbs.,	-	-	-	-	\$3 18

REPORT ON HOGS.

1865.

June 14, To cash paid for 61 hogs, including interest to Oct. 25th,

		\$1,692 81	
Meal fed to hogs,	-	-	436 57
Revenue, butchering, freight, &c.,	-	-	194 72
			2,324 10
By cash for 61 hogs,	-	-	\$3,922 18
Whey sold and boarding hogs,	-	-	43 50
			3,965 68
Total sale of hogs,	-	-	\$3,965 68
Cost,	-	-	2,324 10
Net gain on hogs,	-	-	\$1,641 58

Received from whey made from 100 lbs. milk, \$0.20 67-100.

BARRE SOUTH CHEESE FACTORY, 1865.

Commenced to make cheese April 14th, and stopped November 3d.	
Number of cow's milk received at the factory, about	375
Number of pounds of milk,	1,225,490
Number of pounds of cured cheese sold,	120,376
Number of pounds of milk to make one pound cured cheese,	10 17-100
Gross sales of cheese,	\$21,130 36
Deduct on carting to depot,	234 31
“ railroad freight,	164 97
“ commission,	390 92
	<hr/> 720 20
Net sales at factory,	\$20,340 16
Average price per 100 lbs. at factory,	\$16 90

EXPENSES OF MANUFACTURING.

Labor, two men and one woman,	\$1,124 41
Boxes, \$530 00, scale boards, \$15 00,	545 00
Rennets, \$113 94, salt, \$68 00,	181 94
Annato, \$20 00, bandages, \$187 93,	207 93
Strainer cloths, &c., \$27 00, ice, \$51 25,	78 25
Wood, \$45 93, coal, \$59 46,	105 39
Soap, \$4 80, sundries, \$31 72,	36 52
Miscellaneous expenses, keeping books, &c.,	90 01
	<hr/> \$2,369 45

Expenses for manufacturing per 100 lbs.,	\$1 96
Add for insurance on cheese, \$30 00, rev. tax, \$10,	\$40 00
Interest on establishment,	300 00
Delivering milk to factory,	956 50
	<hr/> \$1,296 50
	<hr/> \$3,655 95

Whole expense charged to manufacturing, per 100 lbs.,	3 03
Net average price per 100 lbs.,	13 87

Hogs.

The Company bought 46 hogs, averaging 184 lbs. each, costing about 15 cents per pound live weight, and sold 42 hogs, averaging 322 lbs. dressed, at 20 and 21 cents per lb., delivered in Worcester.

Lost four hogs—one killed by other hogs, one died with a stoppage, and two from some cause not determined.

Paid for meal and grain \$550 00. Profit after paying all expenses—the hog accounts being kept entirely distinct from the cheese business—and including the amount paid for hogs lost, \$1,325.00; sold whey, \$25.00; making, 1,350.00. Value of the whey used per cow, \$3.60.

The scarcity of hogs, and the high prices at which they were held in the Spring, prevented the Company from putting in a full stock of hogs, and nearly or quite one-half of the whey was wasted. The Company are of the opinion that if they had had one hundred hogs, and had given them some meal during the whole time they were there, that the hogs they had would have done better, and they would have realized three times as much profit as they did. The hogs were fed with all the whey they would eat, and from the time of commencing until about the middle of June, most of them did well. From that time until about the middle of July, about one-half gained, and the other half did not; and from then until about the middle of August, about one-third gained, one-third did not improve any, one-third lost flesh, and two died. Eight or ten of the failing ones were then put into a pasture, and commenced feeding all with meal. In two or three weeks the sick ones got well and were put back into the pens, and from that time until they were slaughtered, about the first of November, the whole lot did remarkably well.

HARDWICK CENTRAL CHEESE COMPANY, 1865.

Capital stock invested by Cheese Company, \$4,200. Number of cows, 407. Time of commencing to make cheese, April 10th; closing, November 10th.

Number of pounds of milk,	- - - - -	1,468,829
Number of pounds of milk to one of cured cheese,	- - - - -	9 655-1000
Number of pounds of cured cheese,	- - - - -	152,117
Cost of help, (three hands,) including board,	- - - - -	\$1,272 00
Expense of cloth used,	- - - - -	175 00
Salt,	- - - - -	135 00
Rennets,	- - - - -	244 00
Boxes,	- - - - -	729 00
		<hr/>
		\$2,555 00

Freight and commission from factory, 96 cents per 100 lbs.; number

of boxes used, 1,920 ; expense of scale boards, \$9.00 ; cost of manufacturing cheese, including interest on capital, \$1.84 per 100 lbs. ; net income per 100 lbs, \$14.90 ; pounds of cheese per cow, 375. Sold in Boston.

SOUTH ADAMS CHEESE FACTORY, 1865.

Average number of cows, 350. Number of pounds of milk, 1,360,980. Number of pounds of green cheese, 141,426. Number of pounds of cured cheese, 132,625. Number of pounds of milk to one of cured cheese, $10\frac{1}{4}$. Cost of boxes, bandages, annatto, salt, &c., 80 cents per 100 lbs. Cost of making per 100 lbs., \$1.00. Total expense of making and material, \$1.80 per 100 lbs. Two and one-fourth rennets used per 1000 lbs. cured cheese. Net sales per 100 lbs., \$17.14.

PROCESS OF MANUFACTURE.

Bring the milk to a temperature of eighty to eighty-four degrees, according to the temperature of the atmosphere. Add rennet of sufficient quantity to produce perfect coagulation in sixty to eighty minutes. Then cut one way with gang knife. In ten minutes cut the other way, and let it stand till whey comes freely. Raise the heat to eighty or eighty-five degrees, breaking the curd while heating. The whey is then drawn off, and heat raised to 100 or 104 degrees, and stands till the curd is nicely cooled. I prefer to have the whey become rancid before draining, and use Ashton's salt, three pounds to one hundred of cheese. Press one hour before turning ; bandage and press again eighteen hours ; then dress, weigh, mark, number and place on the rack in dry room, and turn daily.

S. L. LINCOLN.

PETERSHAM CHEESE FACTORY, 1865.

Capital invested, \$4,200. Time of commencing to make cheese, June 20th ; closing, September 20th.

Number of pounds of milk, 335,702 ; number of pounds of milk to one of cured cheese, 10 7-16. Help at factory, one man, one woman, and forty-eight days for a woman in addition ; cost of help, including

board, \$386.70. Cost of manufacturing, per 100 lbs., \$2.00. Amount of cured cheese, 32,033 lbs. Number of boxes used, 303; cost, \$112.11. Freight and commission, \$1.00 per 100 lbs. Cheese sold in Boston. Net income per 100 lbs., \$14.80.

Number of cows, 281. Made cheese three months. Number of pounds of cheese per cow, 114, the milk from many of the cows not being sent all of the time. Whey taken by those who sent milk.

LEWIS SANDERSON, *Secretary.*

NEW BRAINTREE CHEESE FACTORY, 1865.

Capital invested,	- - - - -	\$7,000.
Largest number of cows,	- - - - -	651
Average do	- - - - -	542
Number of pounds of milk,	- - - - -	1,769,679
Number of pounds of cured cheese,	- - - - -	173,498
Net income per 100 lbs.,	- - - - -	\$14.87
Pounds of milk to one of cured cheese,	- - - - -	10.2

Whole expense of manufacturing, including interest on capital, bandages, boxes, freight, commission, &c., 3 cents per pound.

The whey of the milk from 373 cows, was kept at the factory to feed to hogs. Kept 79 hogs.

Received for hogs,	- - - - -	\$5,437 95
Cost of hogs, meal and all incidental charges, with interest on land,	- - - - -	3,295 12
Net income on hogs,	- - - - -	\$2,412 83

BLANFORD CHEESE FACTORY, 1865.

Number of pounds of milk,	- - - - -	117,593
Green cheese,	- - - - -	12,618
Cured cheese,	- - - - -	11,862
Number of pounds of milk to one of cured cheese,	- - - - -	9.91

Sold cheese for 16, 17, 18, 18½, 19 and 20 cents per pound, without boxes. (Individual factory.) Bought the milk; paid 8 mills per pound and half the receipts of cheese over \$12 per 100 pounds.

WORCESTER CO. CHEESE FACTORY IN WARREN, 1865.

Capital invested,	-	-	-	-	-	-	-	-	-	\$4,600
Average number of cows,	-	-	-	-	-	-	-	-	-	450
Number of pounds of milk,	-	-	-	-	-	-	-	-	-	1,343,000
Number of pounds of cured cheese,	-	-	-	-	-	-	-	-	-	131,379
Number of pounds of milk to one of cheese,	-	-	-	-	-	-	-	-	-	10.2

Cost of making and material, \$2.40 per 100 lbs. This does not include freight and marketing, as the cheese was sold at the factory.

Net income per 100 lbs., 14.41. Number of pounds per cow, 292.

PROCESS OF MANUFACTURE.

Receive the milk every morning, from six to eight o'clock, (Sundays excepted.) Use three gallon cans. The night's milk is cooled in the cans, and generally kept in cold water until brought to the factory. Think it would be well to cool the morning's milk about thirty minutes before it is sent to the factory, in order to prevent its changing too quick in the vats. Heat to eighty-two degrees for setting. Before putting in the rennet, dip off the top of the milk, and pass through the strainer; then stir thoroughly, in order to mix in the cream. Do not want to see signs of coagulation in less than twelve or fifteen minutes, and do not want it to become sufficiently hard to cut in less than one hour, neither do we want it to go over an hour and a half. Cut the curd first lengthwise of the vat, then let it stand until the whey separates from the curd and nearly covers the surface; then cut crosswise. After the cutting is done apply the heat, stirring the curd with the hands. Heat to eighty-eight degrees, and then place the strainer over the vat, and draw off about one-half the whey. After removing the strainer, break up the curd with the hands; then apply the heat, and run it up to 96 or 98 degrees, according to the weather and condition of the curd. Stir until brought to an even temperature, and then cover up and let stand until ready to dip out, which is from one to three hours. Like to have the whey changed a little when the curd is taken out. Salt in the sink, after draining out the whey; use about three pounds of salt to one thousand pounds of milk. Make our own coloring; one pound annatto, and one-half pound potash make one gallon; use one gill to a vat of four thousand pounds. Let the curd stand about thirty minutes after it is put into the hoop, before pressing; press very light at first, and about two hours before bandaging. Think it better to press two days, if possible. Like to have the temperature of the dry-house from seventy to eighty degrees, but in its present condition the temperature cannot be controlled. Grease the surface of the cheese as soon as taken from the press, but not the

sides for a week or more. Receive no milk on the Sabbath. Saturday night's milk is brought in before eight o'clock, and run up; generally get it in scald about half past ten o'clock. After that time it needs but one hand to take care of it until ready to come out, which is generally from four to five o'clock Sunday morning. By this management we get our Sunday work pretty much out of the way before breakfast. Sunday morning milk, if taken care of, will make good cheese on Monday. Whey is carried home by those who furnish milk.

Whole number of cows, about 550; average number not over 450. Out of fifty dairies only sixteen had milk in the factory every month. Number of pounds of milk received, 1,343,000. Number of pounds of cured cheese, 131,379; pounds of milk required for one pound of cheese, 10.2, average. The average would have been better had the dairies all continued through the season. The yield of cheese was some less, about .3, in the months of June, July and August, than the average of the season. Average weight of cheese when cured, about seventy pounds. Cheese shrink from four to five pounds in curing. Made cheese from the 3d of April to the 13th of October.

G F. BROWN,

Superintendent Worcester County Cheese Factory.

SECOND ANNUAL REPORT

OF THE

MASSACHUSETTS

Cheese Manufacturers Association,

FOR THE YEAR 1866.

SOUTHBRIDGE:
JOURNAL OFFICE, PRINTED BY H. C. GRAY.
1867.

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1867.



REPORT.

The second annual meeting of the Massachusetts Cheese Manufacturers Association, was held at the Town Hall in West Brookfield, on Thursday, Feb. 21st, 1867. The meeting was fully attended, although the day was unpropitious, showing very clearly the increasing interest and attention this branch of dairy husbandry is receiving. It has become well settled in the minds of those who have given the subject a fair investigation, that this is the true mode of manufacturing cheese. Not only is there found to be a great economy of labor, but that cheese commands a higher price in our markets. It is also proved, by carefully tried experiments, that a greater amount of cheese is produced by the factory system than the common dairy method.

It was shown at the meeting, by those who had carefully experimented, that it took about one pound less of milk at the factory than by the old method to make a pound of cheese, and that the net income exceeded two cents per pound. This arises from these two facts, that it takes less milk for a pound of cheese, and that it commands a higher price in the markets.

Those who are interested in the dairy, and especially those particularly interested in cheese factories, will scan with much care the following reports, to ascertain which has made the best returns to its patrons, and to discover, if possible, why one factory has made better returns than another. Is it because some have produced a better quality of cheese, or been more fortunate in sales of the same quality, or from the amount of capital invested, or because some have been more economical in the expense of manufacture and materials used? These are questions worthy the attention of all those interested in the several factories. It will be seen that the net income varies from \$15 to \$17.02 per hundred, a variation of over two cents per pound, New Braintree standing the highest, and South Adams the lowest. Barre Central stands at \$15.91, while the other in the same town stands at \$16.92. Hardwick Central and Hardwick South have nearly the same variation.

Eleven factories have been in operation the past year, viz: two in Barre, two in Hardwick, one in Petersham, one in New Braintree, one

in Warren, one in South Adams, one in Westboro, one in Blanford, and one in West Brookfield. The last mentioned is a condensing factory, using only their surplus milk for cheese. They report that they made, during the year, thirty thousand pounds of cheese, but gave no further report. Blanford was not reported at the meeting, neither was Westboro. The last was the only factory that made butter and cheese, and from what information we have been able to obtain, are led to the belief that the butter part was a success, and that their failure on cheese, a part of the season, was owing, in a great measure, to a want of skill on the part of the operator. The other nine factories report a capital invested of \$44,866.57. That they received the milk of over three thousand cows, (the exact number not given.) That the whole amount of milk was 10,604,518 pounds, from which was made 1,072,705 pounds of cheese, which brought to the farmers, after paying all expenses, \$175,240.62. This is an average of \$16.336 per hundred pounds. It will be seen that it takes, on an average, 10.013 pounds of milk for one pound of cured cheese, while there is a variation of 1.28 pounds. Petersham report that they made a pound of cheese from 9.40 pounds of milk, while South Wilbraham used 10.68 pounds, Hardwick Center 9.54, Hardwick South 10.30, Barre Central 9.77, while at Barre South it took 10.46 pounds. The question will naturally arise, why this difference? Is it because the milk is so much better in one locality than another? or is it the process of manufacture? or are some more careful in getting the exact weight of their milk? These are questions which need to be carefully considered.

Circulars were issued to the several factories under the direction of the Executive Committee, which brought in a much fuller report than the year previous. Circulars will again be issued, and it is earnestly requested that there should be great care in the reports, that it may be shown, if possible, why there should be so great a difference in the reports from the several factories. It is in this way that the Cheese Association can be made serviceable to the dairying community.

It was voted to hold a semi-annual meeting, to be called by the Executive Committee, at such time and place as they shall deem advisable, and that said Committee visit the different factories during the season, to gather what information they may be able, and report to the Association.

The report of the treasurer showed a balance of \$32 in the treasury after paying all current expenses.

We give the reports as far as they have been submitted.

N. S. HUBBARD, *Secretary.*

BRIMFIELD, March, 1867.

OFFICERS OF THE ASSOCIATION FOR 1867.

PRESIDENT:

HOLLIS TIDD, of New Braintree.

VICE PRESIDENTS:

D. S. ELLIS, of Warren,

| J. F. DAVIS, of Barre.

SECRETARY:

N. S. HUBBARD, of Brimfield.

TREASURER:

B. F. HAMILTON, of New Braintree.

EXECUTIVE COMMITTEE:

HOLLIS TIDD, of New Braintree,
D. S. ELLIS, of Warren,
J. F. DAVIS, of Barre,

| N. S. HUBBARD, of Brimfield,
| B. F. HAMILTON, of New Braintree.

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LIST OF MEMBERS.

BARRE.

Peter Harwood,
W. R. Bassett,
T. P. Root,

C. A. Merriam,
James F. Davis,
Miletus Henry,

John T. Ellsworth,
Francis D. Rice.

BRIMFIELD.

N. S. Hubbard,
G. F. Brown,

Calvin Baker,
Sumner Parker,

Alured Homer.

HARDWICK.

J. W. Powers,
J. M. Robinson,

B. W. Sherman,
Elijah C. Newton

J. C. Paige.

NEW BRAINTREE.

Hollis Tidd,
William A. Mixter,
Josiah P. Gleason,

Josiah Bush,
B. F. Hamilton,
J. M. Green,

Moses H. Fay.

PETERSHAM.

Lewis Sanderson,

Merrick Blanchard.

SOUTH ADAMS.

S. L. Lincoln,

A. J. Bucklin.

WORCESTER.

Draper Ruggles.

NORTH BROOKFIELD.

William H. Ayres,

J. C. Ayres.

WEST BROOKFIELD.

E. F. Henshaw,
E. Fairbanks,
J. G. Bruce,
W. B. Stone,
G. A. Barnes,

F. M. Carew,
J. W. Bailey,
L. H. Chamberlain,
Z. E. Cary,
Manley Pierce,

A. W. Smith,
Josiah Henshaw,
Oliver F. Davis.

WARREN.

Dwight Ellis,
D. S. Ellis,
Samuel L. Fisk,

D. W. Shepard,
J. E. Patrick,
Marcus Burroughs,

D. R. Tyler,
D. E. Young,
S. N. Gleason.

WILBRAHAM.

D. B. Merrick,

Henry Dewey.

R E P O R T S .

BARRE CENTRAL CHEESE FACTORY, 1866.

Amount of capital invested, \$7,500.00. Time of commencing to make cheese, April 30th. Time of closing, November 3d.

Whole amount of milk, 1,531,219 pounds. Number of pounds of milk to one of cured cheese, 9.77. How long was cheese kept before sending to market? 35 days. Amount of help at the factory, two men and one woman. Cost of help, including board, \$992.23. Cost of manufacturing per 100 pounds, \$1.94; freight and commission, \$0.90,—\$2.84. Amount of cured cheese, 156,711 pounds. Amount of cloth used, 983 yards, at $17\frac{1}{2}$ cents per yard, \$172.03. Amount of salt per 1000 pounds of milk, 2.70 pounds. Number of cheese made, and number of boxes, 2,257. Cost of boxes, 35 cents each, made at Coldbrook, Mass. Amount paid for freight and commission, \$1,355.48. Cheese sold mostly in Boston. Net income per 100 pounds, \$15.91. Number of cows each month—May 340, June 403, July 563, August 529, September 512, October 425; average 462. Pounds of cheese per cow, 335. No report on hogs sent in.

BARRE SOUTH CHEESE FACTORY, 1866.

Amount of capital invested, \$5,053.23. Milk house, 32 by 60 feet, one story. Dry house, with dwelling attached, 26 by 116 feet, two stories. Time of commencing to make cheese, April 24th. Time of closing, November 8th.

Whole amount of milk, 707,297 pounds. Number of pounds of milk to one of cured cheese, 10.46. How long was cheese kept before sending to market? from 30 to 100 days; average 55 days. Size and weight of cheese, 855 from 70 to 80 pounds; 726 from 18 to 22 pounds. The small cheese not bandaged or boxed. Amount of help at the factory, one man and one woman. Cost of manufacturing per

100 pounds, \$0.869. Carting, freight and commission, \$1.00: other expenses, \$1.061,—\$2.93. Amount of cured cheese, 67,570 pounds. Amount of cloth used, 442 yards, at $16\frac{3}{4}$ cents per yard, \$74.04. Kind of salt used, F. F. Onondaga; amount not given. Number of cheese made, and number of boxes, 853. Cost of boxes, 35 cents each, made at Coldbrook, Mass. Expense of freight and marketing, including freight to the railroad, \$559.90. Where was cheese sold? 14,625 pounds at the factory, 52,945 at Boston. Net income per 100 pounds, \$16.92. Number of cows, 175. Pounds of cheese per cow, 406. Value of whey fed to hogs. Profit, \$234.05.

REPORT ON HOGS.

Kept 48 hogs, besides some kept by the week. Kept whey by them all the time. Cost of corn and meal, \$517.77. Cost of hogs, \$1,302.74. Lost one. Average live weight when purchased, 204 pounds; average dressed, $349\frac{1}{2}$ pounds; gain per hog, besides shrink from live to dead weight, $145\frac{1}{2}$ pounds. Net profit on hogs, \$234.05.

HARDWICK CENTER CHEESE FACTORY, 1866.

Amount of capital invested, \$4,213.04. Building is three stories high. The first story is a basement, and is used for a workhouse, the second and third for dry rooms.

Time of commencing to make cheese, April 12th. Time of closing, November 24th.

Whole amount of milk, 2,059,600 pounds. Number of pounds of milk to one of cured cheese, 9.54. How long was cheese kept before sending to market? from 22 to 30 days. Size and weight of cheese, 7 to 9 inches high, 18 inches in diameter, weight about 73 pounds. Amount of help at the factory, two men and one woman, and one extra man three months.

Cost of help, including board, \$1,566.35. Cost of manufacturing per 100 pounds, including interest on capital, taxes, freight and commission, \$2.35. Amount of cured cheese, 215,832 pounds. Amount of cloth used, 1,729 yards, costing \$293.97. Amount of salt used per 1000 pounds of milk, 2.70 pounds. Number of cheese made, 2,792. Number of boxes used, 2,771. Cost of boxes, 37 cents, made in Hardwick. Expense of freight and marketing, 98 cents per 100 pounds. Cheese sold in Boston on commission. Net income per 100 pounds, \$16.55. Whey carried home by milk contributors.

J. D. MANDELL,	} <i>Directors.</i>
C. C. SPOONER.	
JASON M. ROBINSON.	

HARDWICK UNION CHEESE FACTORY, 1866.

Amount of capital invested, \$4,500. Time of commencing to make cheese, May 10th. Time of closing, October 15th.

Whole amount of milk, 722,526 pounds. Number of pounds of milk to one of cured cheese, 10.30 pounds. How long was cheese kept before sending to market? from three to six weeks. Size and weight of cheese, 18 by 8 inches, weight 80 pounds. Amount of help at the factory, one man and one woman. Cost of help, including board, \$511.56. Amount of cured cheese, 70,963 pounds. Cost of cloth used, (amount not given,) \$102.81. Number of cheese made, and number of boxes used, 886. Cost of boxes, 36 cents, made at Coldbrook, Mass. Cost of manufacture, including interest on capital, fuel, and expense of freight and marketing, \$3,464. Cheese sold in Boston by Utley & Boynton. Net income per 100 pounds, \$15,601. Number of cows for the season, average 210. Pounds of cheese per cow, 351.

PETERSHAM CHEESE FACTORY, 1866.

Amount of capital invested, \$5,500. Building 32 by 70 feet, three stories high. Time of commencing to make cheese, May 14th. Time of closing, October 14th.

Whole amount of milk, 819,714 pounds. Number of pounds of milk to one of cured cheese, 9.40. How long was cheese kept before sending to market? from one to six months. Size and weight of cheese, hoop 18 inches, 70 pounds. Amount of help at the factory, one man and two women. Cost of help, including board, \$535. Cost of manufacturing per 100 pounds, \$1.66. Amount of cured cheese, 87,138 pounds. Amount of cloth used and cost, \$113. Amount of salt used, 10 bags and 4 barrels, costing \$70. Used four pounds of annatto, cost \$5. Number of cheese made, 1,251. Boxes used, 1,200. Cost of boxes and where made, 37 cents each, and made by Oliver & Haskins, at Coldbrook, Mass. Cheese was sold at Boston and at the factory. Net income per 100 pounds, \$16.50. Number of cows not given.

L. SANDERSON, *Secretary.*

NEW BRAINTREE CHEESE FACTORY, 1866.

Amount of capital invested, \$8,000. The building is 165 by 31 feet, two stories high, with basement 65 by 31 feet. In this is the manufacturing room, with four vats heated by steam. The dry room, first above the basement, is 165 by 31 feet. The dry room in the second story is 100 by 31 feet. Cheese is raised to the dry room by an elevator.

Time of commencing to make cheese, April 16th. Time of closing, November 18th.

Whole amount of milk, 1,714,172 pounds. Number of pounds of milk to one of cured cheese, 9.84. Cheese was kept at the factory about 40 days. Weight of cheese, about 40 pounds. Put two in a box. Amount of help at the factory, two men and two women. Cost of help, including board, \$1,311.68. Cost of manufacturing per 100 pounds, \$2.78. Amount of cured cheese, 174,203 pounds. Amount of cloth used, 2,300 yards, costing \$390. Amount and kind of salt used per 1000 pounds of milk, 27-16 pounds of Liverpool salt. Whole cost of salt, \$89. Cost of rennets and annatto, \$150. Number of cheese made, 3,927. Number of boxes used, 1,800. Cost of boxes, \$648, made at Coldbrook. Expense of freight and marketing, \$1,531.08. Cheese was sold principally in Boston. Net income per 100 pounds, \$17.02. Largest number of cows, 510; average about 400. Pounds of cheese per cow, 435½. About half the whey was taken away by the contributors of milk. The remainder was fed to hogs without profit.

HOG REPORT.

Ninety-four hogs were kept in a lot of five acres, about 43 rods from the factory. Weight of hogs when put in, 15,267 pounds. Average, 162½ pounds. Dressed weight, 27,047 pounds. Average, 288½ pounds. Gain, 125½ pounds from live to dead weight, but owing to the high price of hogs in the spring, and subsequent decline of pork in autumn, the cost and receipts were about equal.

PROCESS OF MANUFACTURE.

First heat the milk before putting in the rennet, to 84 degrees, after which let it stand from one to one and a half hours before crossing. Then let it stand fifteen or twenty minutes. Then break it up carefully with the hands, and heat to 90, and from that to 98 degrees. Cover up warm, and let it stand until cooked. Dip it out into a sink, and let it drain dry, and salt at the rate of 27-16 pounds to 1000 pounds of milk. Put in hoops and press twenty-four hours.

GRAYLOCK CHEESE FACTORY, SOUTH ADAMS, 1866.

Amount of capital invested, \$3000. Description of buildings: main building 100 by 30 feet, with wing 20 by 15, for press room. Thirty feet of the main building is for cheese making, and the remainder for dry room.

Time of commencing to make cheese, April 9th. Time of closing, November 30th.

Whole amount of milk, 1,194,708 pounds. Number of pounds of milk to one of cured cheese, 9.97. Cheese was kept sixty days before sending to market. Weight of cheese, 100 pounds. Amount of help at the factory, one man and two women. Cost of help, including board, \$826. Cost of manufacturing per 100 pounds, \$1.20. Amount of cured cheese, 119,805 pounds. Amount of cloth used, 750 yards of 40 inch cloth, 15 cents per yard, \$112.50. Use Astor's salt, three pounds to 1000 pounds of milk. Cost, \$70. Other materials, \$50. Number of cheese made and boxes used, 1,188. Cost of boxes, 50 cents each, made at H. Anthony's, South Adams, Mass. Expense of freight, 27 cents per 100 pounds, and four per cent. commission, 50 cents freight to Boston, and five per cent commission. Cheese sold at Boston and New York. Net income per 100 pounds, \$15. Average number of cows, 300. Pounds of cheese per cow, 399. Value of whey per cow, \$5.

SOUTH WILBRAHAM CHEESE FACTORY, 1866.

Amount of capital invested, \$2,500. Time of commencing to make cheese, May 3d. Time of closing, November 23d. Amount of milk, 403,287 pounds. Number of pounds of milk to one of cured cheese, 19.68. Cheese was kept one month before sending to market. Size and weight of cheese, hoop 9 by 20 inches, cheese 70 lbs. Amount of help at the factory, one man and one woman. Cost of help, including board, \$421. Cost of manufacturing, \$1.68 per 100 pounds. Amount of cured cheese, 37,716 pounds. Amount of cloth, 480 yards. Cost \$78.00. Amount of salt used 4 6-16 pounds per 1000 pounds of milk. Number of cheese made and boxes used, 535. Cost of boxes, 25 cents each, made at Cheshire. Cheese sold in New York. Net income per 100 pounds, \$17. Average number of cows, 100. Cheese per cow, 377 pounds.

WORCESTER COUNTY CHEESE FACTORY, 1866.

Amount of capital invested, \$4,600. Buildings—manufactory, press room and dry room, with tenement. The manufactory is 30 by 40 feet, with posts 10 feet high. Press room 16 by 58 feet, with posts 8 feet high. Dry house 26 by 100 feet, two stories high.

Time of commencing to make cheese, April 2d. Time of closing, October 31st. Amount of milk, 1,451,995 pounds. Number of pounds of milk to one of cured cheese, 10.17. Cheese was kept from 30 to 60 days. Size and weight of cheese, 13 and 18 inch hoops; small size 28 to 30 pounds, large 70 to 75 pounds. Amount of help at the factory, two men and two women, and one extra woman five months. Cost of help at the factory, including board, \$1,249.23. Cost of manufacturing per 100 pounds, \$2.36, not including freight and marketing. Amount of cured cheese, 142,767 pounds. Amount of cloth used, 1,185 yards, costing \$189.68. Used 2.93 pounds of Syracuse F. F. dairy salt for 1000 pounds of milk. Cost of salt, \$63.42. Cost of rennets, annatto, dressing, potash and scale boards, \$271.18. Number of cheese, 500 small, and 1,781 large. Cost of boxes, 25 cents for small, and 37 cents for large. Made by Oliver & Haskins, Coldbrook, Mass. Cheese mostly sold at the factory, and sent to Boston and Springfield. Net income per 100 pounds, \$16,598. Number of cows, average 475. Pounds of cheese per cow, 300. Whey taken away by the milk contributors. All the cloth used by the several factories was sized.

PROCESS OF MANUFACTURE.

Cheese made in tin vats, and steam used for heating. When a vat of milk is ready to set, dip all the cream from the top of the milk and pour through the strainer, after which stir the milk thoroughly with a dipper, in order that it may be well mixed. We then heat the milk to 82 degrees in hot weather, and 84 degrees in cool weather, stirring the milk occasionally while heating, to prevent the cream rising. Put in the rennet and stir well for three or four minutes, after which agitate the surface gently until coagulation can be detected; then cover up and let it stand from 50 to 70 minutes, or until the curd is hard enough to cut. Like to have rennet enough in to show signs of coagulation in about 15 minutes, and not much sooner. Cut the curd first lengthwise of the vat, and then let it stand until the whey separates and nearly covers the curd. Cross the curd and apply the heat, working the curd with the hands. Heat to 88 or 90 degrees, then cut the curd about as fine as shelled corn. After cutting draw off about one half the whey, then stir up again, and heat to 96 degrees, or 98 if the

weather is cool. Always stir the curd gently with the hands while heating, and until the temperature is even through the curd. We then cover up and let it stand until hard enough to dip out and salt, which is from one to three hours, varied by the weather and condition of the curd. Use $2\frac{1}{2}$ pounds of salt to 100 gallons of milk. After salting dip into the hoops and let it stand fifteen minutes or more, and then put on the followers and press lightly. Press about an hour and a half before bandaging. Press two days, and then take out of press, trim and grease on the surface, and carry into the dry house. Let them stand from three to six days before greasing on the sides, to let them dry and prevent moulding.

G. F. BROWN, *Sup't.*





FOURTH ANNUAL REPORT

OF THE

MASSACHUSETTS

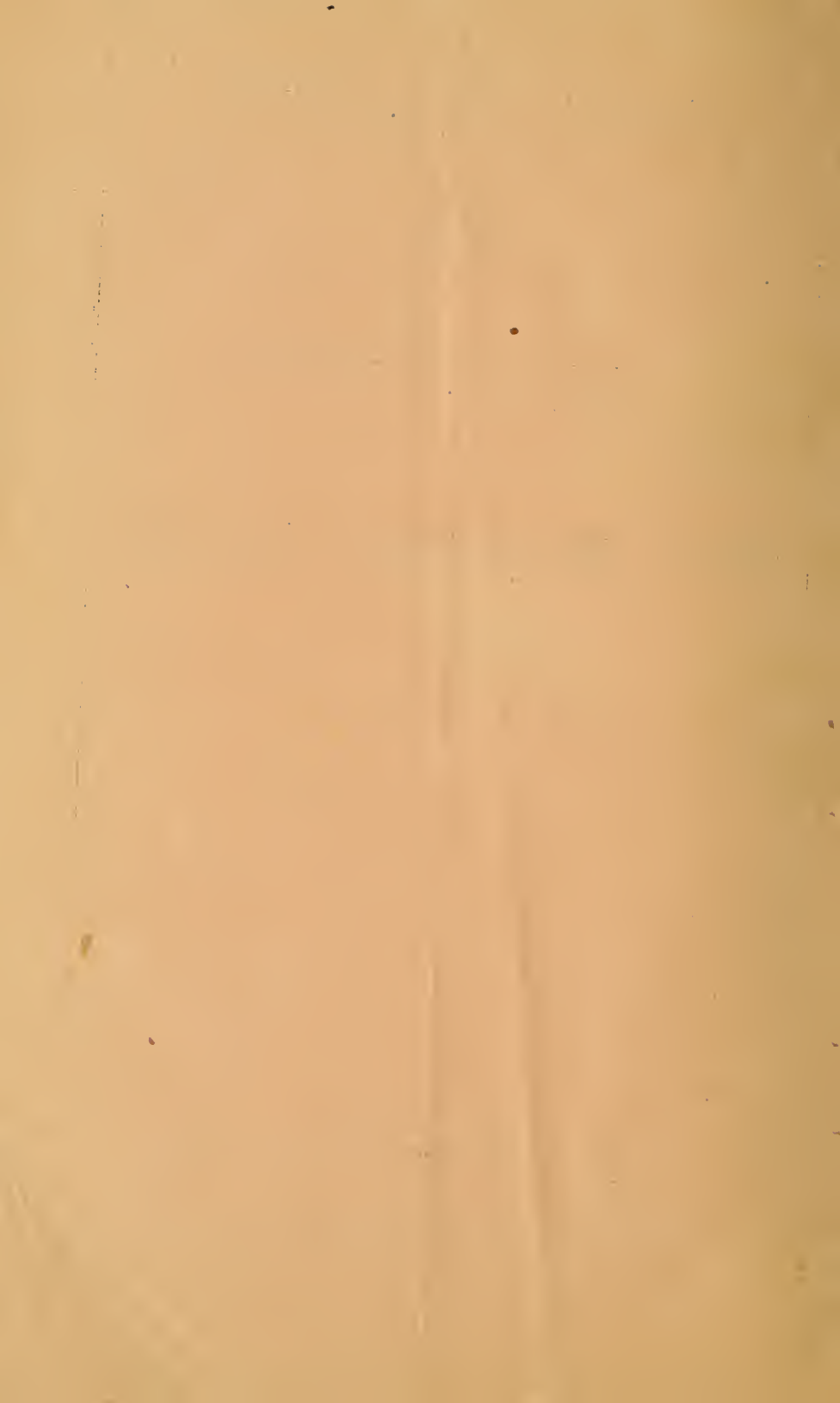
Cheese Manufacturers' Association,

FOR THE YEAR 1868.

SOUTHBRIDGE:

JOURNAL OFFICE. PRINTED BY WM. B. MORSE.

1869.



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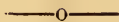
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R E P O R T .



THE Massachusetts Cheese Manufacturers' Association held their fourth annual meeting at the Town Hall in Barre, on Thursday, February 19th, 1869. As the attention of the people is called more to the factory system of cheese making, the interest in these annual gatherings increases greatly.

In the State of New York one man sold all the cheese he should make for the season for a stipulated sum, and as his cheese had a good reputation the price was a little in advance of other parties, so that one of his neighbors wished to put his in at the same price ; but as this would make two dairies instead of one, and there might be a difference in the quality of the cheese, it was proposed that one of them should bring his milk to the other, so that it might all be manufactured together as one dairy. This was in 1850 or 1851. From this date to the present time factories have rapidly increased, until they now number over eight hundred in the State of New York alone.

In Massachusetts the first factory went into operation in April, 1864, and under a call signed by Dwight Ellis, of Warren, and a few others, a meeting was held in West Brookfield, at which the Massachusetts Cheese Manufacturers' Association was formed, and four factories reported their doings, viz : South Adams, Barre, Hardwick Center and Worcester County, Warren. After this meeting the Secretary received several reports, which will be found in the printed annual report for that year.

There are now not less than twenty factories in successful operation in Massachusetts, and the number is greatly increasing ; and it is to be regretted that reports cannot be obtained from all of them, so that we can give the amount of factory cheese made in our own State. The Secretary sent blanks in the early part of the season for returns from all the factories, and since the meeting at Barre has sent to all that did not report at that time, but reports from only ten of the twenty factories, viz : Barre Central, Barre South, Barre South-west,

New Braintree, Hardwick Center, Wilbraham, Belchertown, Worcester County, at Warren, Petersham, and Warren Cheese Company, at Warren. These reported that they made 1,095,850 pounds of cheese. It is to be regretted that we cannot give a full report from all the factories, and the amount of cheese made. We hope this matter will be carefully considered, and in the future every factory will report themselves.

The officers of the Association made a special effort to render the annual meeting this year of greater interest and profit than usual, and were fortunate in securing the services of ex-Lieut. Governor Simon Brown, of Concord, Hon. Charles L. Flint, Secretary of the Massachusetts Board of Agriculture, and Dr. George B. Loring, of Salem. Governor Brown's address, the evening previous to the convention, was listened to with marked attention and interest. His subject was the nature of the atmosphere, its effects upon the soil and vegetation, and gave us many valuable suggestions as to the best methods of securing the greatest results from its action upon the soil. He dwelt largely upon under-draining, showing the great benefit to be derived from removing the surplus water, thereby rendering the soil lighter and more susceptible to atmospheric influence, and far more productive. He gave a very interesting account of an experiment he had made in under-draining a piece of meadow land, that produced only about a ton of hay per acre, and that of a poor quality. After it was reclaimed by draining he was able to cultivate it so that it produced at least three tons per acre, and of a good quality also, besides a good crop of rowen.

The address of Mr. Flint on the dairy and dairy stock was one of great interest, as well as of great practical importance to the dairying community, showing clearly that much may be done to improve the milking qualities of the dairy stock, and that the dairyman whose object is to produce milk, should direct special attention to developing as largely as possible these qualities. He said that cows in a wild state produced but a small quantity of milk, and that it was only by improving them that they were brought to so great a degree of perfection; and that the tendency was to retrograde, unless there was a counteracting influence. Mr. Flint also stated that in the manufacture of cheese there was great value in whey for the purpose of manufacturing sugar of milk. That the whey contained $4\frac{1}{2}$ per cent. of the article, and that it was valuable for medicinal purposes. A committee was accordingly appointed, of which J. T. Ellsworth, of Barre, is chairman, to investigate and report at a future meeting.

Dr. Loring, (always interesting,) held the attention of a large

audience in the evening, on the subject of stock breeding. He said no State was all fitted to any one breed of cattle, but different localities were suited to larger or smaller and more hardy breeds, according to the productions of the soil. That we could not compete with the West on beef, therefore the dairy must predominate in Massachusetts, and he who does anything to improve the dairy stock is a public benefactor. He gave it as his opinion that the Ayrshire, or the peculiarities of the Ayrshire, was the best for dairy cows; manifested no particular fancy for the Jersey stock, but said it was better to get two pounds of butter per day from a cow that gives eighteen than eight quarts of milk, as there would be more value left in the former than in the latter case. After getting a good dairy stock it was of the utmost importance to feed properly, and not expose to storms or severe cold, and not feed oil cake or cotton seed much, as it would tend to injure the cows although it might appear for a time to be beneficial.

Several important matters were discussed. It appeared by the reports that some factories made more than three times the amount of cheese with the same number of rennets than others, which led to a discussion on the mode of curing them. The calf should not suck just before being butchered, and when the rennet is taken out it should not be washed, but with a cloth be wiped perfectly clean and salted, and after laying a few days a little more salt added, and stretched on something to dry.

It was also enjoined upon all cheese makers to be very cautious about receiving milk in bad condition, as a small quantity of milk in bad order might change the flavor of a whole vat of cheese.

The report of the Treasurer showed a balance of \$31.00 in the treasury, which, with the addition of sixty-seven new members, puts the treasury in good condition for the present.

Mr. John Henry read an interesting essay on cheese making, which the Association voted to print in the transactions; also, Mr. Young, of Warren, on floating curds.

The citizens of Barre are deserving of thanks for their generous appropriations for defraying the expenses of the Association, and their hospitality to those who came from different sections of the State, and after a vote of thanks to the citizens and orators the Association dispersed, feeling that they had been interested and profited by the meeting.

N. S. HUBBARD, *Secretary.*

BRIMFIELD, March, 1869.

OFFICERS OF THE ASSOCIATION FOR 1869.

PRESIDENT :

THOMAS P. ROOT, of Barre.

VICE PRESIDENTS :

WILLIAM A. WARNER, of Hardwick,
LEWIS SANDERSON, of Petersham.

SECRETARY :

N. S. HUBBARD, of Brimfield.

TREASURER :

B. F. HAMILTON, of New Braintree.

EXECUTIVE COMMITTEE :

THOMAS P. ROOT, of Barre,
WILLIAM A. WARNER, of Hardwick,
LEWIS SANDERSON, of Petersham,
N. S. HUBBARD, of Brimfield,
B. F. HAMILTON, of New Braintree.

PREAMBLE AND CONSTITUTION

OF THE

MASSACHUSETTS CHEESE MANUFACTURERS' ASSOCIATION.

PREAMBLE.

Whereas, it is deemed expedient to organize an Association, through which as a medium, results of the practical experience of dairymen may be gathered and disseminated to the dairying community, therefore,

Resolved, That we do hereby associate ourselves together for mutual improvement in the art and science of cheese making, and more efficient action in promoting the general interests of the dairying community.

CONSTITUTION.

ARTICLE I. The name of the organization shall be the MASSACHUSETTS CHEESE MANUFACTURERS' ASSOCIATION.

ARTICLE II. The officers of the Association shall consist of a President, two Vice Presidents, Secretary and Treasurer.

ARTICLE III. The President, Vice Presidents, Secretary and Treasurer, shall constitute the Executive Board of the Association.

ARTICLE IV. The officers of the Association shall be elected at the regular annual meeting, and shall retain their offices until their successors are chosen.

ARTICLE V. The regular annual meeting shall occur on the third Wednesday in February of each year, and at such place as the Executive Board shall designate.

ARTICLE VI. Any person may become a member of the Association, and be entitled to all its benefits, by the payment of one dollar.

LIST OF MEMBERS.

BARRE.

Peter Harwood,
W. R. Bassett,
T. P. Root,
C. A. Merriam,
James F. Davis,
Miletus Henry,
John T. Ellsworth,
Francis D. Rice,
Daniel G. Harwood,
Wilcut Harwood,
Clark Jamerson,
Edmund W. Allen,
Nathaniel E. Holland,
Hiram Wadsworth,
Edwin Woods,
Loring F. Woods,
John E. Henry,
Charles M. Spooner,
Job Stetson,
Henry E. Rice,

John W. Rice,
John F. Woods,
Joseph Robinson,
Joel B. Hinekley,
Henry M. Cutler,
J. Henry Goddard,
Emery A. Howe,
Austin Hawes,
A. H. Holland,
Albert S. Holland,
P. H. Babbitt,
Israel Fisher,
George Brown,
Benjamin Upton,
Cyrus Atwood,
Franklin Babbitt,
Justin Reynolds,
Harding Woods,
J. W. Jenkins,
Estes Hawes,

E. R. Bemis,
Franklin Smith,
Oramel Clark,
Nelson Loring,
E. H. Egley,
E. B. Shattuck,
David Fay,
James N. Patterson,
L. F. Billings,
G. H. Lane,
S. S. Hamilton,
Isaac Smith,
S. E. Bates,
Mrs. J. T. Ellsworth,
" J. H. Goddard,
" Peter Harwood,
" F. D. Rice,
" Miletus Henry,
" D. G. Harwood.

BRIMFIELD.

N. S. Hubbard,
G. F. Brown,

Calvin Baker,
Sumner Parker.

Alured Homer.

HARDWICK.

J. W. Powers,
J. M. Robinson,
B. W. Sherman,

Elijah C. Newton.
J. C. Paige.
Elbridge Ruggles,

W. A. Warner, Jr.

NEW BRAINTREE.

*Hollis Tidd,
William A. Mixer,
Josiah P. Gleason.

Josiah Bush,
B. F. Hamilton,
J. M. Green,

Moses H. Fay,
Moses Pollard,
D. G. Barr.

PETERSHAM.

Lewis Sanderson,
Merrick Blanchard,
George A. Bryant,

Jairus Williams,
Silas Wheeler,
Henry S. Miner,

D. C. Paige.
Mrs. Henry S. Miner.

SOUTH ADAMS.

S. L. Lincoln,

A. J. Bucklin.

WORCESTER.

Draper Ruggles.

* Deceased.

NORTH BROOKFIELD.

W. H. Ayres,
J. C. Ayres.

Royal Pickard,
D. W. R. Hinckley,

C. T. Huntington.

WEST BROOKFIELD.

E. F. Henshaw,
E. Fairbanks,
J. G. Bruce,
W. B. Stone,
G. A. Barnes.

F. M. Carew,
J. W. Bailey,
L. H. Chamberlain,
Z. E. Cary,
Manley Pierce,

A. W. Smith,
Josiah Henshaw,
Oliver F. Davis.

WARREN.

Dwight Ellis,
D. S. Ellis,
Samuel L. Fisk,
D. W. Shepard,
J. E. Patrick.

Marcus Burroughs,
D. R. Tyler,
D. E. Young,
S. N. Gleason,
John Bridges,

Giles Blodgett,
T. H. Jones,
C. H. Shepard.

WILBRAHAM.

D. B. Merrick.

Henry Dewey.

WESTBORO.

Lyman Belknap.

BOSTON.

C. L. Flint.

L. Wetherell.

CONCORD.

Simon Brown.

HUBBARDSTON.

Andrew Gleason.

Danforth Clark.

PHILLIPSTON.

Courtland Sanderson

James W. Hager.

DANA.

N. S. Johnson.

OAKHAM.

Cheney R. Adams.

Alonzo Lincoln.

SHERBURNE.

Andrew Hunt.

BLANDFORD.

W. E. Boise.

MR. HENRY'S ESSAY.

Mr. President, Gentlemen of the Cheese Association:—

The factory mode of cheese making is rapidly spreading through America, as well as foreign lands. There is no doubt, in my mind, but that the time is coming when all our cheese will be made in this manner. This system has become too deeply rooted into our minds to let it die out now. Your wives and our sisters would not be willing again to take upon themselves the cares and toils of cheese making, from which they have been so happily relieved. I believe if you would see your sons take to themselves wives, and settle down on your or their homestead farms, you must build more cheese and butter factories.

Progress is a law of nature; from the earliest dawn of creation there has been a constant series of improvements and progress. Geology reveals that the progress of man is still destined to be onward and upward. So it is with cheese making; the art is to grow on and on. The foundation has been laid, and this generation will mount one round higher in the scale than our fathers have.

As yet we are "in our infancy," as it were, in the art of cheese making. It is not as simple a trade as many may think, to be able to manufacture the first quality of factory cheese. Long have we studied, and longer still *must* we, before we shall reach perfection in the art.

Dairying in its various forms has long been a subject of much study and attention.

The farmer who retails his milk can enjoy the privilege of selling all the watery substance of his milk, while others who cannot so dispose of it are obliged to take out the solid, or preservable parts, to send to market.

The point we wish to gain to-day is, the *manner* in which we shall take out this preservable part, to have it of the first quality. In the reports of the different factories to-day, we find no two that exactly agree. We know there are no two factories that perform their work exactly in the same manner, making, as we see by their figures, a difference in *quantity* as well as *quality*. Now there are no secrets in cheese or butter making, but what one can find out by close attention to the business.

It is with this, as with other kinds of business, it is the little points that are to be watched, and learned. If these are neglected they are

like the "leaven which leaveneth the whole lump." Some think if one follows the rules for cheese and butter making there is no such thing as a failure. Rules may guide, but give me one practical and experimental thought for a dozen thoughts laid down in rules.

We know milk is delicate; so delicate are its particles that it absorbs or drinks in every offensive odor that comes in contact with it. A pan of milk will purify the air of a room, by absorbing all the impurities in the air of the room. Then it is necessary, if we would have pure, untainted milk, to keep everything that comes in contact with it clean and sweet. Tainted milk will *make tainted cheese*, or butter, if the milk has been in this condition even a *short* time. The bad substance will not all pass off in the whey or watery part of the milk, but the solid part will retain some of the impurities, giving a bad flavor to the cheese or butter.

I think tainted, or bad flavored cheese, is caused more by the handling and surrounding bad odors at home, than by the working, or uncleanness at the factory; or, in other words, the absorbing particles of the milk get full of good or bad substance before the milk arrives at the factory.

If you wish to have good cheese, give your cows sweet food, keep everything sweet that the milk comes in contact with, carry your milk to the factory sweet, see that your cheese maker keeps everything sweet at the factory; also, see that the curd is taken from the vat when the whey is sweet, then you cannot fail to have good cheese at twenty-five or thirty days old. Worcester County cheese is sold too green to judge of its quality; for all cheese makers know—or ought to—that if their cheese is to be sold at twenty-five days old, it cannot be made by the same rule they would be governed by in making cheese to be kept six months or more.

You are too well acquainted with the factory system of cheese-making to be told the process again.

Last year I met a York State cheese-maker, and learned from him that some of the cheese-makers there work their curds faster than is commonly done with us. Their mode is to raise the temperature of the curd to 104 degrees, let it stand and cool five or ten minutes, then cold water is set running round the vat to cool the curd. As soon as it is cooled to 90 or 95 degrees it is dipped into the sink, salted, and worked very much as we work ours. I have eaten cheese made in this manner which was of a superior quality.

There are a few things necessary to be known and understood before one can understand the art of cheese-making. In the first place, one should know exactly in what state the milk they are working is.

If they are a little afraid of it they had better watch it, and not let it get the upper hand of them. Then they should know the strength of the coloring, rennet, and salt used, that they may use just enough and no more. I believe there is more trouble arising from not knowing the strength of the salt than in all of the other things put into the cheese.

The cheese-maker should be careful and not salt his curd when there is too much whey in it; if he does the strength of the salt runs off in the whey, causing—if in warm weather—a strong and bad flavored cheese. It is the lack of salt that causes so much bad and strong cheese. Some would say it was because there was too much rennet used, which made the cheese strong. I am yet to be made to believe that the use of too much rennet will make a strong cheese. If it affects the cheese at all it would make it hard and crumbling. Dry and crumbly cheese is not the article our New England markets call for, so we have to guard against the use of too much rennet, or too much salt, also guard against cooking the curd too dry, if we would guard against a dry and crumbly cheese.

There is more danger in letting the curd stay in the whey too long than in taking it out too soon. A curd, if taken from the vat warm, will cook and harden in the sink, also, the light and air will set the color of the curd if it can stand in the sink an hour or more; think it better for the curd than to be put directly into the hoop as soon as salted; have seen curds that have stood in the sink an hour and half, or two hours, when put into the hoop and the pressure immediately applied that you could not start the white whey from. I never saw a curd that would not press or adhere together because of standing in the sink too long.

One word about floating curds. They are of two kinds. One we call a cream curd, caused by not stirring the milk after the rennet is put in, giving the cream an opportunity to rise, so when the whey separates from the curd you have the cream part of it floating on the whey. This we *do not like to see*, as it tells us that the workman is careless and neglectful. The other is caused by some cause unknown to me. Sometimes it rises gradually, again it may rise all at once. If I had a curd like the last, as soon as I saw it was going to rise I would dip it into the sink, and salt it a little more than the rule of salting. This will keep the cheese from becoming spongy, or rising, as it would have done if allowed to remain longer in the vat.

Most of you understand how to prepare the coloring and rennet. I wish to give you the manner in which the Shakers, at Enfield, Conn., soak out and preserve their rennet. In the month of March they

soak out rennet enough to last the season ; they preserve it by salting the liquid a little, and keeping it in a sweet, cool cellar. Their reasons for soaking out in March are, they can get the strength from the rennet better in that month than in any other, also, it is more easily preserved. I also learned from the Shakers that they used saltpetre in their cheese. This I have tried, and like its working so well I shall try never to do without it.

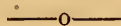
The Shakers excel in their productions of cheese and butter, and I wish we knew more of their mode of managing their dairies. As we have said before, milk is delicate, and occasionally we find a can of milk soured from some unknown cause. Of course the men do not wish to be blamed for the trouble it makes, so they, most of them, blame their wives or maids for not taking proper care of their cans, &c. In nine cases out of ten, I will venture to say, the ladies should not be blamed. You may have a sick cow which gives bad or inflamed milk ; or a cow may get hooked, or otherwise injured in the pasture. Your hired help who milks the cow may know the milk is not all right, but thinking it will pass at the factory, puts it in. If in warm weather, it is very apt to spoil a can of milk, and if not discovered when carried to the factory, by your overseer, it is liable to spoil a vat of cheese. If the cheese is spoiled then the cheese-maker is blamed, &c. Now I wish to say, if you find spoiled milk, or cheese, do not blame any one until you have found out the cause of its being so, then it is for your interest to look after it.

In closing I wish to say a few words to those of you who have the management, and are directors of cheese companies. Your most perplexing trouble in the business is with your help at the factory. You should have confidence in your help, and they confidence in you. Do not break or lose the confidence of your help in you, for when they have lost their confidence in you, you have lost your influence over them. You should always be on friendly terms with your overseer, always ready to lend him or her a helping hand, if they need it. If any trouble arises go to them and find out all about it. A kind look will do more good than a cross word. Go, or send some one occasionally to work in their stead, and let them go out from their closely confined business. This will make them feel that their occupation is not so unpleasant, also that they can find in you a friend.

JOHN E. HENRY.

BARRE, February 18, 1869.

REPORTS.



STATEMENT OF BARRE CHEESE COMPANY, OF BUSINESS OF 1868-69.

Capital invested, \$5,200. Commenced to make cheese April 8th. Stopped making November 11th. Number of days, 216. Number of cows for the season, 350. Number of pounds of milk, 1,326,224. Pounds of milk to make one pound of cured cheese, 10. Cheese kept from 30 to 50 days. Weight of cheese when cured, 65 to 75 lbs. Gross sales of cheese, \$21,791.56. Carting to depot, \$238.14. Railroad freight and commission, \$637.86—\$876.00—or, for 100 lbs. cured cheese, 65c. Labor, including board, \$902.54—or, for 100 lbs. cured cheese, 68c. Materials had in manufacturing, &c., including rennets, annatto, salt, wood and coal, boxes, scale-boards, soap and cloth, \$964.95—or, on 100 lbs. cured cheese, 72c. Incidental expenses, including insurance, taxes, repairs, sundry outlays for labor other than for making cheese, and interest on establishment, \$823.76—or, to make 100 lbs. cheese, 62c. Whole expenses for manufacturing and selling cheese, for 100 lbs. cheese, \$2.67. Net sales of cheese per 100 lbs., \$13.77.

Hogs.

Paid for 44 hogs, at 10 cents per lb. and interest, \$956.05. Meal, \$513.59. Care of hogs, \$30. Other expenses, \$220.03—\$1,719.67. Received for pork, sold mostly in Worcester, at 15 cents per lb., \$2,140.10. Lard, \$69.55. Keeping hogs, \$27.38. Whey sold, \$74.60—\$2,311.63. Profit, \$591.96, which was divided among contributors of 1,056,834 lbs. of milk. Live weight of hogs, 8,918 lbs. Dead weight of hogs, 14,324 lbs. Gain over live weight, 5,408 lbs., or, 123 lbs. per hog. Began to feed corn and meal in May.



BARRE CENTRAL CHEESE COMPANY, 1868.

Amount of capital invested, \$8,000.00. Time of commencing to make cheese, April 6th. Time of closing, November 25. Whole

amount of milk in pounds, 1,691,083. Number of pounds of milk to one of cured cheese, 9 35-100. Length of time cheese was kept before sending to market, 40 to 60 days. Number, size and weight of cheese, 2,438, 18 inch, weight 75 lbs. Amount of help at the factory, one female and two males. Cost of help, including board, \$1,214.20. Number of rennets 442, cost \$110.62. Number of boxes, 2,438, cost, \$609.50. Cost of cloth used, \$166.44. Mode of heating, by Ralph's vats. Cost of fuel, \$136.08. Amount and kind of salt used, F. F. Dairy Salt, 5000 lbs. Total expense per pound in getting cheese ready to send from the factory, 1 90-100. Expense of freight and marketing, $\frac{3}{8}$ c. per lb. Amount of cured cheese, 180,855 lbs. Net income per 100 lbs., \$14.50. Value of whey, 37 cents per 1000 lbs.

RETURN OF BARRE SOUTH-WEST CHEESE FACTORY, 1868.

Amount of capital invested, and description of buildings—\$650—manufacturing room 28 by 17½, dry room 20 by 17½. Time of commencing to make cheese, May 25th. Time of closing, October 16th. Whole amount of milk in pounds, 271,840. Number of pounds of milk to one of cured cheese, 10.9. Length of time cheese was kept before sending to market, from 30 to 40 days. Number, size and weight of cheese—7 per day, size 12 by 7, weight 26 lbs. Amount of help at the factory, one man all of the time, and a lady one-fourth of the time. Cost of help, including board, \$384. Number and cost of rennets—100 rennets at 30 cents each. Cloth, 140 yards, cost \$31. Mode of heating, by Miller's heaters. Amount and cost of fuel, 5 cords of wood at \$4 per cord—\$20. Salt, 3 bbls. Expense of freight and marketing, 87½ cts. per 100 lbs. Amount of salt used per 1000 pounds of milk, 2½ lbs. Amount of cured cheese, 24,920 lbs. Net income per 100 lbs., \$13.87. Average number of cows for the season, 100. Pounds of cheese per cow, 249 20-100.

RETURN OF THE HARDWICK CENTER CHEESE FACTORY, 1868.

Amount of capital invested, and description of buildings—\$4,250, or, divided into 42½ shares, the stock has been all taken up and paid for, and the company have a surplus of \$778.17, which has been

gained this year after paying all expenses. Description of the building, same as has been given before. Time of commencing to make cheese, April 6th. Time of closing, November 24th. Whole amount of milk in pounds, 2,047,467. Number of pounds of milk to one of cured cheese, 9 90-100. Length of time cheese was kept before sending to market, 30 to 40 days. Number, size and weight of cheese—2,790, 18 inches diameter, average weight 74 lbs. Amount of help at the factory, one man and one woman all the time, in addition one man six months, and one man three months. Cost of help, including board, \$1,426.98. Number of rennets, 1,247, cost \$405.14. Number of boxes 2,771, cost 25 cents each, \$692.75. Amount and cost of cloth used, not ascertained. Mode of heating—use Ralph's vats, heat by wood fire. Amount and cost of fuel—15 cords slab wood, \$74.50; use coal in dry rooms. Amount and kind of salt used, and cost of the same—24 bbls. F. F. Dairy, Syracuse, cost of same, \$101.22. Expense of freight and marketing, .739 7-10 per 100 lbs. Amount of salt used per 1000 pounds of milk, 2 70-100 lbs. Amount of cured cheese, 206,570 lbs. Net income per 100 lbs., \$14.441, after paying interest on capital, taxes, manufacturing expenses, labor, freight, commissions, &c. Whey carried home by milk contributors. No butter made at the factory. No hogs kept. Average price of cheese in market, \$16.788 per 100 lbs. Average price paid to milk contributors, \$14.183 per 100 lbs. Whole expense of manufacturing, including interest on capital invested and taxes, labor, freight and commissions, \$2.347 per 100 lbs., leaving a balance to the company of .258 per 100 lbs. as profits, or to make repairs, &c., which amounts to \$532.45.

RETURN OF THE NEW BRAINTREE CHEESE FACTORY, 1868.

Time of commencing to make cheese, 20th of April. Time of closing, December 1. Whole amount of milk in pounds, 1,919,815. Number of pounds of milk to one of cured cheese, 10 1-20. Length of time cheese was kept before sending to market, new milk from 30 to 40 days, 2 meals from 60 to 75. Number, size and weight of cheese, 35 to 40 lbs. and 70 lbs. Average amount of help at the factory $3\frac{1}{2}$ hands. Cost of help including board, \$1,260.13. Number of rennets, 584, cost \$136.60. Number of boxes, 2500, cost 25 cents each, \$625. Amount of cloth used, 2,173 yards, cost of cloth and scale boards, \$251.50. Mode of heating, by steam. Amount and cost of

fuel—12 tons coal, \$172.83, 42 cords wood, \$224.92, total \$397.75. Used 22 sacks Liverpool salt, cost \$85. Annatto, \$66.18. Total expense per pound in getting cheese ready to send from the factory, $1\frac{1}{2}$ cents. Expense of freight and marketing, \$1700.94. Amount of salt used per 1000 lbs. of milk, $2\frac{1}{2}$ lbs. Amount of cured cheese, 191,117 lbs. Net income per 100 lbs., \$13.80, average gross sales, \$16.80. Whole number of cows 525, average for the season, 475. Pounds of cheese per cow, 400. Process of manufacturing cheese: Heat the milk to 64 degrees, then put in sufficient rennet to have it curdle in not less than thirty minutes' time; then let it stand thirty minutes; then cross it and let the curd settle ten minutes; then heat it to 90 degrees; then draw part of the whey off, and then heat to 100 degrees; then cover it and let it stand from two to three hours according to the state of the weather; then dip it out and salt it and put it into the press.

RETURN OF THE WILBRAHAM CHEESE FACTORY, 1868.

Amount of capital invested, \$2,500. Time of commencing to make cheese, May 25th. Time of closing, October 30th. Whole amount of milk in pounds, 386.774. Number of pounds of milk to one of cured cheese, 9.64. Length of time cheese was kept before sending to market, 20 to 40 days. Number, size and weight of cheese—654 large, 68 small; large size about 60 lbs., small size 20 lbs. Amount of help at the factory, one man all the time, and one extra man ten weeks. Cost of help including board, \$623.76. Number and cost of rennets—105, cost 30 cts. each, \$31.50. Number and cost of boxes—650 at 30 cts. each, \$195.00. Amount and cost of cloth used—200 yards bandage, 6 yards press, cost \$23.50. Mode of heating—with wood. Amount and cost of fuel—7 cords of wood, \$30.00. Amount and kind of salt used, and cost of the same—4 sacks F. F. Syracuse, \$14.00. All other expenses connected with the manufacture of cheese amount to \$7.50. Amount of salt used per 1000 pounds of milk—43 ounces. Amount of cured cheese—40,117 lbs. Net income per 100 pounds—\$12.27. Butter was made the last twenty days from *cream*, both sweet and sour, generally sweet. No pigs are kept at the factory, each patron taking his proportion of the whey.

RETURN OF THE WORCESTER COUNTY CHEESE FACTORY,

1868.

Amount of capital invested, \$5,200. Time of commencing to make cheese, March 30. Time of closing, November 7. Whole amount of milk in pounds, 1,516,009. Number of pounds of milk to one of cured cheese, 9 76-100. Length of time cheese was kept before sending to market, 30 to 40 days. Number, size and weight of cheese, 2128 about 70 lbs. each, 290 at 25 lbs. each. Amount of help at the factory, two men and one woman. Cost of help, including board, \$1,404.09. Number of rennets, 508, cost \$150. Number of boxes, 2128, cost 26 cents each, small cheese sold without boxes. Mode of heating, by steam. Amount and cost of fuel—23 cords wood, cost \$88.50, 4464 lbs., coal cost \$22.32. Used 4,500 lbs. F. F. Dairy salt. Total expense per pound in getting cheese ready to send from the factory, $2\frac{1}{4}$ cents. Cheese sold at the factory. Amount of salt used per 1000 pounds of milk, 3 lbs. Amount of cured cheese, 155,233 lbs. Net income 100 pounds, \$13.056. Number of cows for the season. 440. Pounds of cheese per cow, 352. Whey carried home by milk contributors. 330 lbs. of butter were made by churning milk; the experiment was not considered of sufficient importance to continue making; made some very nice whey butter, which brought 40 cents per pound; got 1 lb. of butter from 100 gallons of whey. No hogs.

RETURN OF BELCHERTOWN CHEESE FACTORY, 1868.

Amount of capital invested, and description of buildings—\$1,200—building is one built for a steam mill, two stories high besides a basement, not belonging to the Cheese Co., but leased by them for \$100 per annum. Time of commencing to make cheese, June 1st. Time of closing, September 15th. Whole amount of milk in pounds, 330,230. Number of pounds of milk to one of cured cheese, 9.85. Length of time cheese was kept before sending to market, 4 weeks. Weight of cheese about 47 lbs. Amount of help at the factory, one male and one female. Cost of help, including board, about \$135.00 per month. Boxes cost 30 cts each. Mode of heating, by steam. Cost of fuel, \$30.00. Amount and kind of salt used, and cost of the same—3 bbls., F. F., \$3.50 per bbl. Total expense per pound in getting cheese ready to send from the factory, about 2 cts. Sold

cheese at the factory. Amount of cured cheese, 29,416 lbs. Net income per 100 lbs., about \$13.00. No butter made. No hogs kept at the factory.

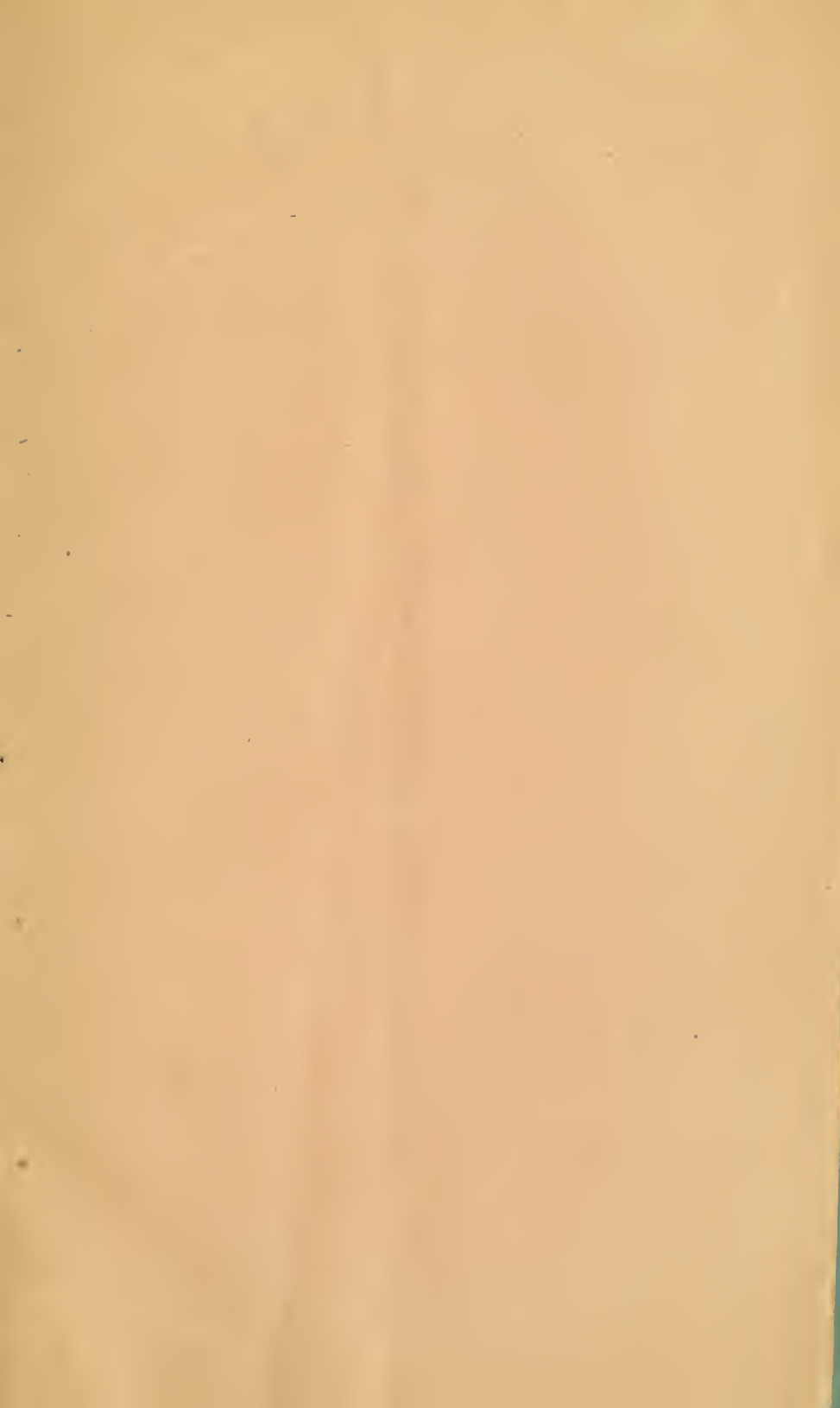
RETURN OF THE WARREN CHEESE FACTORY, 1868.

Amount of capital invested, \$2,750. The building is of wood, two stories high, 26x60, with L for boiler. Commenced to make cheese, April 26. Closed September 30. Whole amount of milk in pounds, 46,223 lbs. Number of pounds of milk to one of cured cheese, 10 $\frac{1}{8}$. Length of time cheese was kept before sending to market, 30 to 60 days. Number, size and weight of cheese, 691, from 65 to 70 lbs. weight, 18-inch. hoop. Amount of help at the factory, 2 men. Cost of help, including board, \$566. Number of rennets, 175, cost \$52.50. Number of boxes, 650 at 26 cents, \$169. Amount of cloth used, 300 yards, cost \$50. Mode of heating, with steam. Amount and cost of fuel—13 cords wood, cost \$68.25. Used 5 barrels Onondago F. F. salt, cost \$22. Total expense per pound in getting cheese ready to send from the factory, \$2.55 per 100 lbs. Expense of freight and marketing, 80 cents per 100 lbs. Amount of salt used per 1000 of milk, 2 $\frac{3}{4}$ to 3 lbs. Amount of cured cheese, 45,614 lbs. Net income per 100 pounds, \$12.89. Number of cows for the season, 170. Whey carried home. No butter made. No hogs kept.

RETURN OF PETERSHAM CHEESE COMPANY, 1868.

Whole No. lbs. milk, 862,531. Whole No. lbs. cheese, 89,386. 9.65 lbs. milk for 1 lb. cheese. \$12.93 per 100 net return. Cost of manufacturing, \$2.35 per 100 lbs. Cost of help, \$650. Man, woman and boy employed. Commenced May 6th. Closed October 19th.







SIXTH ANNUAL REPORT
OF THE
MASSACHUSETTS

Cheese Manufacturers' Association,

FOR THE YEAR 1870.

SOUTHBRIDGE:
JOURNAL OFFICE, PRINTED BY WM. B. MORSE.
1871.

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REPORT.

The Massachusetts Cheese Manufacturers' Association held their sixth annual meeting at West Warren, on Tuesday and Wednesday, Feb. 14th and 15th, 1871.

Although the weather was very stormy there was a goodly number in attendance, showing the interest they feel in these yearly gatherings. At two o'clock P. M., the meeting was called to order by the President, Thomas P. Root, Esq., of Barre, who made some appropriate remarks upon the objects and aims of the Association, and the importance of the investigation of subjects calculated to increase the productive capacity of our New England farms. He congratulated the Association upon the prosperity that had attended them the past year, and welcomed them to this their sixth annual gathering. On closing he introduced to the audience Dr. J. R. Nichols of Boston, who interested and instructed his hearers with a lecture on "Manures, general and special." We would like to give the lecture in full, were it not for the depleted condition of the funds of the Association, which in the future will be in better condition, if the several factories which carry out the recommendation of the last meeting of the Association to appropriate the small sum of one cent for every one hundred pounds of cheese made at each factory. In this way the meeting of the Association can be made more interesting and instructive, and much valuable information diffused through the dairying community.

Dr. Nichols spoke of a farm he purchased in Haverhill, Essex county, in 1863, and commenced a series of experiments with special fertilizers, which proved a great success. When purchased, the farm would support but few cattle, so that it seemed absolutely necessary to bring into requisition special manures. At the present time the farm will keep eighteen cows, five horses, and a yoke of oxen a part of the year. The product of the farm the past year was fifty tons of hay, two hundred bushels of corn, twenty bushels of rye, and large quantities of apples, grapes, and other fruits. The farm was raised from its unproductive condition by the use of special manures, so that

it is now capable of sustaining a herd of animals, which now supply all the fertilizing material needed, so that the use of special manures is not necessary. The lecture was followed by a discussion in which many of the members of the Association participated.

In the evening Dr. George B. Loring, of Salem, (always interesting), delivered one of his popular and interesting lectures on the subject of general farming, to a large and enthusiastic audience. He contrasted the past with the present, and showed the demand for increasing intelligence in the farming community, which was being supplied from various sources.

At nine and a half o'clock A. M., Wednesday, the Association re-assembled for the choice of officers, the hearing of reports, and the discussion of any questions connected with the interests of the dairy. The Secretary and Treasurer's reports were read and accepted. The Treasurer's report showed a balance of a little over ten dollars, after paying all expenses.

A committee on finance, of which A. H. Holland, of Barre, was chairman, reported that each factory be invited to contribute one cent on every hundred pounds of cheese made, which, although small, would enable the Association to make their meetings more interesting and furnish much valuable information. The President spoke of the importance of carrying out this plan, and the secretary was instructed to furnish each factory a copy of this report, and ascertain how many will comply with this request.

There was much discussion of the importance of having rennets carefully prepared, that there may be no taint about them when used. It was shown by the reports that less rennets were used this season than last, proving that attention has been called specially to this subject.

The attention was called to the condition of milk when delivered at the factory, some seeming to have an idea that it makes but little difference if the milk is not positively sour. But it was shown that a small quantity of milk not in perfect order would change the flavor of a large quantity of cheese.

Mr. Pickard, of North Brookfield, who had been to Australia to teach them in the art of cheese-making, spoke of the English mode of preparing rennets, which was by rubbing salt on them and then drying. Said he was very particular in cooling milk. Never put warm and cold milk together, but, if properly cooled separate, it would make more and better cheese. Mr. Ellsworth, of Barre, said they had found more trouble with the morning's milk being closely shut up and carried to the factory without being cooled. Many others spoke on various subjects connected with cheese-making, which the funds of the

Association will not allow us to put in print. We hope another year the condition of the finances will allow of a more full and detailed report.

The Committee reported the following Resolutions, which were unanimously adopted: —

Resolved, That we hereby tender to Dr. J. R. Nichols and Dr. George B. Loring our thanks for the interesting and valuable information contained in the addresses with which they have favored the Association.

Resolved, That the Association acknowledge their obligations to the citizens of West Warren for their attentions and liberality on the occasion of its annual meeting.

Resolved, That the thanks of the Association be extended to the members of the press for their interest in taking note of the proceedings.

N. S. HUBBARD, *Secretary*.

BRIMFIELD, April, 1871.

OFFICERS OF THE ASSOCIATION FOR 1871.

PRESIDENT :

THOMAS P. ROOT, of Barre.

VICE PRESIDENTS :

D. S. ELLIS, of Warren.

E. W. BOISE, of Blandford.

SECRETARY :

N. S. HUBBARD, of Brimfield.

TREASURER :

B. F. HAMILTON, of New Braintree.

EXECUTIVE COMMITTEE :

THOMAS P. ROOT, of Barre,

D. S. ELLIS, of Warren,

E. W. BOISE, of Blandford,

N. S. HUBBARD, of Brimfield,

B. F. HAMILTON, of New Braintree.

PREAMBLE AND CONSTITUTION

OF THE

MASSACHUSETTS CHEESE MANUFACTURERS' ASSOCIATION.

PREAMBLE.

Whereas, It is deemed expedient to organize an Association, through which, as a medium, results of the practical experience of dairymen may be gathered and disseminated to the dairying community, therefore,

Resolved, That we do hereby associate ourselves together for mutual improvement in the art and science of cheese-making, and more efficient action in promoting the general interests of the dairying community.

CONSTITUTION.

ARTICLE I. The name of the organization shall be the MASSACHUSETTS CHEESE MANUFACTURERS' ASSOCIATION.

ARTICLE II. The officers of the Association shall consist of a President, two Vice Presidents, Secretary and Treasurer.

ARTICLE III. The President, Vice Presidents, Secretary and Treasurer, shall constitute the Executive Board of the Association.

ARTICLE IV. The officers of the Association shall be elected at the regular annual meeting, and shall retain their offices until their successors are chosen.

ARTICLE V. The regular annual meeting shall occur on the third Wednesday in February of each year, and at such place as the Executive Board shall designate.

ARTICLE VI. Any person may become a member of the Association, and be entitled to all its benefits, by the payment of one dollar.

LIST OF MEMBERS.

BARRE.

Peter Harwood,
W. R. Bassett,
T. P. Root,
C. A. Merriam,
James F. Davis,
Miletus Henry,
John T. Ellsworth,
Francis D. Rice.
Daniel G. Harwood,
Wilent Harwood,
Clarke Jamerson,
Edmund W. Allen,
Nathaniel E. Holland,
Hiram Wadsworth,
Edwin Woods,
Loring F. Woods,
John E. Henry,
Charles M. Spooner,
Job Stetson,
Henry E. Rice,
John W. Rice,

John F. Woods,
Joseph Robinson,
Joel B. Hinkley,
Henry M. Cutler,
J. Henry Goddard,
Emery A. Howe,
Austin Hawes,
A. H. Holland,
Albert S. Holland,
P. H. Babbitt,
Israel Fisher,
George Brown,
Benjamin Upton,
Cyrus Atwood.
Franklin Babbitt,
Justin Reynolds,
Harding Woods,
J. W. Jenkins,
Estes Hawes,
E. R. Bemis.
Franklin Smith,

Oramel Clarke,
Nelson Loring,
E. H. Egley,
E. B. Shattuck,
David Fay.
James N. Patterson,
L. F. Billings,
G. H. Lane,
S. S. Hamilton,
Isaac Smith,
S. E. Bates,
Abner R. Mott,
W. A. Tolman,
M. D. Eaton,
Mrs. J. T. Ellsworth,
" J. H. Goddard,
" Peter Harwood,
" F. D. Rice,
" Miletus Henry,
" D. G. Harwood.

BRIMFIELD.

N. S. Hubbard,
G. F. Brown,

Calvin Baker,
Sumner Parker,

Alured Homer.

HARDWICK.

J. W. Powers,
J. M. Robinson,
B. W. Sherman,
Elijah C. Newton,
J. C. Paige,
Elbridge Ruggles,
W. A. Warner, Jr.,
Charles A. Wheeler,
Charles Ruggles,
John B. Aiken,

S. P. Hillman,
John A. Newcomb,
Wilder N. Barnes,
George Manly,
F. D. Ruggles,
Frazier Paige,
J. W. Paige,
Constant Southwick,
F. B. Aiken,
George Warner,

Bela B. Paige,
Dwight Billings,
John Paige,
Simon Stockwell,
C. L. Warner,
C. W. Mann,
Moses Ruggles,
S. S. Dennis,
W. F. Slany,
C. S. Clark.

NEW BRAINTREE.*

* Hollis Tidd,
William A. Mixter,
Josiah P. Gleason,
Josiah Bush,

B. F. Hamilton,
J. M. Green,
Moses H. Fay,
Moses Pollard,

D. G. Barr,
H. A. Hoyte,
W. A. Wheeler.

PETERSHAM.

Lewis Sanderson,
Merrick Blanchard,
George Bryant,

Jairus Williams,
Silas Wheeler,
Henry S. Miner,

D. C. Paige,
Mrs. Henry S. Miner.

SOUTH ADAMS.

S. L. Lincoln,

A. J. Bucklin.

*Deceased.

WORCESTER.

Draper Ruggles.

NORTH BROOKFIELD.

W. H. Ayres,
J. C. Ayres,Royal Pickard,
D. W. R. Hinkley,

C. T. Huntington.

WEST BROOKFIELD.

E. F. Henshaw,
E. Fairbanks,
J. G. Bruce,
W. B. Stone,
G. A. Barnes,F. M. Carew,
J. W. Bailey,
L. H. Chamberlain,
Z. E. Cary,
Manley Pierce,A. W. Smith,
Josiah Henshaw,
Oliver F. Davis,
William Adams, Jr.

WARREN.

Dwight Ellis,
D. S. Ellis,
Samuel L. Fisk,
D. W. Shepard,
J. E. Patrick,
Marcus Burroughs,
D. R. Tyler,D. E. Young,
S. N. Gleason,
John Bridges,
Giles Blodgett,
T. H. Jones,
C. H. Shepard,
R. H. Blair,W. S. Gilbert,
W. A. Patrick,
S. R. Burroughs,
C. H. Ellis,
E. A. Day,
C. C. Bliss,
Calvin Cutter.

WILBRAHAM.

D. B. Merrick,

Henry Dewey.

WESTBORO.

Lyman Belknap.

BOSTON.

C. L. Flint,

L. Wetherell,

Dr. J. R. Nichols.

CONCORD.

Simon Brown.

SALEM.

Dr. George B. Loring.

HUBBARDSTON.

Andrew Gleason,

Danforth Clark.

PHILLIPSTON.

Courtland Sanderson,

James W. Hager.

DANA.

N. S. Johnson.

PERU.

M. Pierce.

OAKHAM.

Cheney R. Adams,

Alonzo Lincoln,

Charles M. Packard.

SHERBURNE.

Andrew Hunt.

BLANDFORD.

W. E. Boise,

E. W. Boise.

LENOX.

Richard Goodman.

WARE VILLAGE.

B. Bond.

ENFIELD.

William B. Kimball.

GREENWICH VILLAGE.

J. H. Walker.

LEE.

Alexander Hyde.

REPORTS.

BARRE CENTRAL CHEESE FACTORY, 1870.

Amount of capital invested, \$8000. Factory 32 by 60, one story, with dwelling attached. Dry house 28 by 96, two stories. Commenced making cheese, April 9. Closed, November 9. Whole amount of milk, 1,622,062 pounds. Number of pounds of milk to one of cured cheese, $10\frac{1}{4}$. Cheese was kept 30 to 60 days before sending to market. Made 2,161, in 18-inch hoop. Weight, 40 to 75 pounds. Amount of help at the Factory, 1 man 6 months, 1 woman seven months, 1 man and 1 woman extra 3 months, equal to 1 man 9 months and 1 woman 10 months. Cost of help, including board, \$1084.28. Used 286 rennets, cost \$71.50. Used 1906 boxes, cost \$481.75. Used 1236 yards cloth, cost \$121.17. Heated by Ralph's vats, with cylinder inclosed in water. Used 24 cords of wood, cost \$122. Used 16 barrels F. F. Dairy salt, cost \$72. All other expenses, \$1278.46. Total expense in getting cheese ready for market, 2.04c per pound. Expense of freight and marketing, \$580.13. Used 2.6 pounds of salt to 1000 pounds of milk. Amount of cheese cured, 158,258 pounds. Net income per 100 pounds, \$12.60. Value of whey, \$500. No butter made. 31 hogs were kept by the company, fed whey until Sept. 1, then fed whey and meal.

BARRE SOUTH CHEESE FACTORY, 1870.

Amount of capital invested, \$4600. Commenced making cheese, April 12. Closed, Nov. 4. Whole amount of milk, 979,047 pounds. Number pounds of milk to one of cured cheese, 10.7. Cheese was kept 30 to 40 days before sending to market. Made 1355 large cheese, 46 small. Amount of help at the Factory, 1 man 7 months, 2 men 5 months. Cost of help, including board, \$767.20. Cost of rennets, \$112. Cost of boxes, 29c each. Cost of cloth, \$118.40. Heated by Ralph's vats. Cost of fuel, \$86.64. Used F. F. Dairy salt, cost \$40.85. Total expense in getting cheese ready for market, including boxes, 2.22c. Expense of freight and marketing, 69c per 100 pounds. Used 43 ounces salt per 1000 pounds milk. Whole amount of cheese, 91,480 pounds. Net income per 100 pounds, \$12.24. Value of whey, \$213. 38 hogs were bought May 1, and kept till Oct. 15. Fed whey all the season, and meal $2\frac{1}{2}$ months. Lost 2 hogs. Net profit, \$227.

BARRE SOUTHWEST CHEESE FACTORY, 1870.

Capital invested, \$600. Commenced making cheese, April 18, and closed Oct. 1. Amount of milk, 385,800 pounds. 10.46 pounds of milk to one of cured cheese. Cheese was kept 30 to 40 days before sending to market. Size 15 inch; average weight, 30 pounds. Help at the Factory, 1 man. Cost of help, including board, \$452. Number rennets 135, cost \$33. Used 267 yards cloth, cost \$25.36. Heated by Miller's patent circulating coil heater. Used $4\frac{1}{2}$ cords wood, cost \$23. Used 4 barrels F. F. Dairy salt, cost \$17. Rent of Factory and repairs, \$25. Total expense in getting cheese ready for market, 1.67c per pound. Expense of freight and marketing, \$1.25 per 100 pounds. Amount of cured cheese, 36,855 pounds. Net income per 100 pounds, \$12.25. Whey carried away by milk contributors.

BELCHERTOWN CHEESE FACTORY, 1870.

Capital invested, \$1200. Building 40 by 65, two stories. Commenced making cheese, May 23. Closed, Sept. 1. Whole amount of milk, 191,440 lbs. 9.91 pounds of milk to one of cured cheese. Cheese was kept from 4 to 6 weeks before sending to market. Made 484 cheese, weight from 12 to 60 pounds. Help at Factory, 1 man. Cost of help, including board, \$75 per month. 60 rennets, cost 20c each. No boxes used. Used 100 yards cloth, cost \$10. Heated by steam. 6 cords wood, cost \$30. Used F. F. Dairy salt. Total expense in getting cheese ready for market, 2.5c per pound. No freight or marketing, as every one sold his own cheese. Amount of cured cheese, 19,321 lbs. Net income per 100 pounds, \$15.

NEW BRAINTREE CHEESE FACTORY, 1870.

Capital invested, \$9000. Commenced making cheese, April 7, and closed Dec. 16. Whole amount of milk, 1,653,005 pounds. 10.4 pounds milk to one of cured cheese. Cheese was kept from 4 to 10 weeks before sending to market. Made two sizes, small size 33 to 35 pounds; large size 70 pounds. Help at Factory, equal to 1 man and 2 women all the time, second man $1\frac{1}{2}$ months. Cost of help, including board, \$1371.50. Used 691 rennets, cost \$172.25. Used 2074 boxes, cost \$622.20. Used 992 yards cloth, cost \$126.31. Heated by steam. 38 cords wood, cost \$220, $1\frac{3}{4}$ tons coal, \$20—\$240. Used 5214 pounds Marshal's salt, cost \$77. All other expenses: Annato, \$44.50. Scale boards, \$18.15. Taxes, \$75.08. Insurance, \$59.10. Interest on capital, \$630. Salary of clerk and directors, \$100. All other incidental expenses \$30.60. Total expense in getting cheese

ready to send to market, $2\frac{1}{4}$ c per pound. Used $2\frac{1}{2}$ pounds salt to 1000 pounds milk. Amount of cured cheese, 158,347 pounds. Net income per 100 pounds, \$12.50. Average number of cows for the season, 425. Pounds of cheese per cow, 372. Value of whey \$756.45.

103 hogs and 10 pigs were bought May 1, at a cost of	\$2052.41
Paid for meal and corn,	965.68
Paid for taxes and interest on capital invested,	95.67
Paid for use of piggery, and tending,	200.00
Paid for dressing and carting,	178.08

\$3,491.84

Balance for whey, 752.95

Receipts for hogs and pigs sold, with the lard, amounted to \$4,244.79

Received for whey sold, 3.50

Gain on hogs, 752.95

Value of whey, \$756.45

GRAYLOCK CHEESE FACTORY, SOUTH ADAMS, 1870.

Amount of milk, 854,339 pounds. Amount of cheese, 88,624 lbs. Average weight, 70 pounds. 9.7 pounds of milk to one of cured cheese. Net income, \$14.01 per 100 pounds. Average amount of cheese to 1 cow, 412 pounds. Amount of help, 1 man and 1 woman. Cost of help, including board, \$460. Number of cheese, 1280.

HARDWICK CENTRAL CHEESE FACTORY, 1870.

Capital invested, \$4250, divided into $42\frac{1}{2}$ shares, and all in the hands of stockholders. Building 30 by 75 feet; basement used for work-room, wood-room and furnace; there are three rooms above for curing cheese that are sealed up; cheese is raised into the dry rooms by an elevator. Commenced making cheese, April 4. Closed, Sept. 30. Whole amount of milk, 1,579,118. 10.151 pounds milk to one of cheese. Cheese was kept 35 days before sending to market. Made 2152 cheese. Size, 18-inch. Weight, 72 pounds. Help at Factory, 1 woman and 2 men. Cost of help, including board, \$1,082.09. Used 710 rennets, cost \$172.37. 2100 boxes, cost \$630. Heated by Ralph's vats. $12\frac{1}{2}$ cords Chestnut wood, \$62.50. Used coal in furnace for dry rooms. Used 10 barrels and 11 sacks F. F. Dairy Syracuse salt, cost \$60.50. Total expense in getting cheese ready for market, 1.592c per pound. Expense of freight and marketing, 7.729c per pound. Used 2.27 pounds salt to 1000 lbs. milk. Cured cheese, 155,616. Net income, \$12.249 per 100 lbs. Whey carried away by milk patrons.

HARDWICK UNION CHEESE FACTORY, GILBERTVILLE, 1870.

Capital invested, \$3100. Commenced making cheese, April 31, and closed Oct. 4. Whole amount of milk, 803,877 pounds. 10.21 lbs. milk to one of cured cheese. Cheese was kept from 5 to 8 weeks before sending to market. Weight, 50 to 75 pounds. Help at Factory, 1 man and 1 woman. Cost of help, including board, \$680. 260 rennets, cost \$65. 986 boxes, cost \$295.80. Cost of cloth, \$111. Heated by steam. 20 cords wood, cost \$100, 4 tons coal, cost \$37.60—\$137.60. 10 barrels F. F. Dairy salt, cost \$40. All other expenses, \$283.41. Total expense in getting cheese ready for market, 2.05c per pound. Freight and marketing, 75c per 100 pounds. Amount of cured cheese, 78,663 pounds. Net income, \$11.40 per 100 pounds.

WORCESTER COUNTY CHEESE FACTORY, WARREN, 1870.

Capital invested, \$5200. Commenced making cheese, April 4, and closed Oct. 22. Whole amount of milk, 1,134,769 pounds. 10.277 pounds milk to one of cured cheese. Cheese was kept 40 to 60 days before sending to market. Size 13 and 18-inch hoop, mostly 18-inch, weight 25 and 70 pounds. Help at Factory, 2 men and 1 woman 4 months. Cost of help, including board, \$1,093.70. Used 430 rennets, cost \$86. Boxes 30c each. Used 825 yards cloth, cost \$78.37. Heated by steam. 25 cords wood \$100, 1½ tons coal \$15—\$115. Total expense in getting cheese ready for market, 2.25c per pound. Cheese sold at the Factory. Used 2.6 pounds salt to 1000 lbs. milk. Amount of cured cheese, 110,412 pounds. Net income, \$12.4621 per 100 pounds. Number of cows for the season, 350. Pounds of cheese per cow, 312. Whey taken away by milk contributors.

COY'S HILL CHEESE FACTORY, WARREN, 1870.

Capital invested, \$6000. Commenced making cheese March 24th, and closed October 15th. Whole amount of milk, 1,239,567 pounds. 9.741 pounds of milk to one of cured cheese. Cheese kept from 30 to 60 days before sending to market. Average weight about 70 pounds. Amount of help at factory, 2 men. Cost, 90 cents per 100 lbs. of cured cheese, including help and board of same, rennets and fuel. 1740 boxes, at 30 cents each. Used 913 yards of cloth, at 9½ cts. per yard. Heated by Miller's circulating coil Cheese Vat. Used 13 bbls. F. F. Dairy salt, at \$3.80 per bbl. Cost 2.08 cts. a pound in getting cheese ready to send from the factory. Cheese mostly sold at the factory. Amount of cured cheese, 127,250 pounds. Net income, \$12.281 per 100 lbs.

WARREN CHEESE FACTORY, WARREN, 1870.

A 2-story frame building, 26x60, with ell for boiler; costing about \$3000. Commenced making cheese May 2d, and closed Sept. 15th. Whole amount of milk, 416,782 pounds. It took 10.14 lbs. of milk to one of cured cheese. Cheese was kept from 40 to 60 days before sending to market. Average weight of cheese, 2 sizes, 40 and 70 lbs. Amount of help, one man and one girl, $3\frac{1}{2}$ months. Cost of help, including board, \$431.12. Used 155 rennets, costing \$38.50. Cost of 135 boxes at 25 cents each, and 383 boxes at 30 cents, \$147.65. Cost of $454\frac{3}{4}$ yards of cloth, at $9\frac{3}{4}$ cts., \$42.56. Heated by a steam boiler. Fuel, \$45.21. Used $6\frac{1}{2}$ bbls. Syracuse F. F. salt, which cost \$24.70. Cost 2.23 cents per pound in getting cheese ready to send from the factory. A large part of the cheese was sold at the factory. 41,100 lbs. of cured cheese. Net income, \$12.25 per 100 pounds. Whey carried home by contributors of milk.

LANESBORO CHEESE FACTORY, BERKSHIRE, 1870.

Capital invested, \$3600; the building is 100x30 feet. Commenced to make cheese April 25th, and closed Nov. 12th. Whole amount of milk, 805,630 pounds. It took 10.202 pounds of milk to one of cured cheese. Cheese was kept from 4 to 6 weeks before sending to market. 1257 cheese, 16 inches in diameter. Help, 2 men, costing, including board, about \$800. Used about 200 rennets, at 20 cents each. Used 1257 boxes, at 30 cents each. Used 600 yards of cloth, at 9 cents a yard. Heated by A. G. Bagg's patent heater. Fuel, 16 cords of wood at \$6 per cord. Salt, 7 sacks of 364 lbs. each, double refined English dairy salt, at \$6.25 per sack. Expense in getting cheese ready to send from factory, 1 cent and 8 mills per pound. Cheese sold at the factory. Used $2\frac{1}{2}$ lbs. of salt per 1000 pounds of milk. Cured cheese, 78,963 lbs. Net income, \$11.638 per 100 pounds; it sold for \$13.638 on an average at the factory. Some that brought milk through the season averaged about 400 lbs. of cheese per cow. Whey carried home by the farmers.

OAKHAM CHEESE FACTORY, OAKHAM, 1870.

Capital invested, \$2000; building 45x32 feet. Commenced making cheese May 16th, and closed Sept. 15th. Whole amount of milk 303,201 pounds. It took 10.8 pounds of milk to one of cured cheese. Cheese was kept from 50 to 90 days before sending to market. 700 cheeses, each 16-inch, about 40 lbs. Help, 2 men, costing, including board, \$400. Used 47 rennets at 25 cents each; 350 boxes at 30 cts. each; 250 yards cloth at 10 cents per yard. Heated by Chas. Miller & Son's coil heater. Used 4 bags Marshall's salt, at \$3.42 per sack, \$13.68. Expense of freight and marketing, 90 cents per hundred. Used $2\frac{1}{2}$ pounds of salt to 1000 pounds of milk. Cured cheese, 28,072 lbs. Net income, \$12 per 100 pounds.

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SEVENTH ANNUAL REPORT

OF THE

MASSACHUSETTS

Cheese Manufacturers'

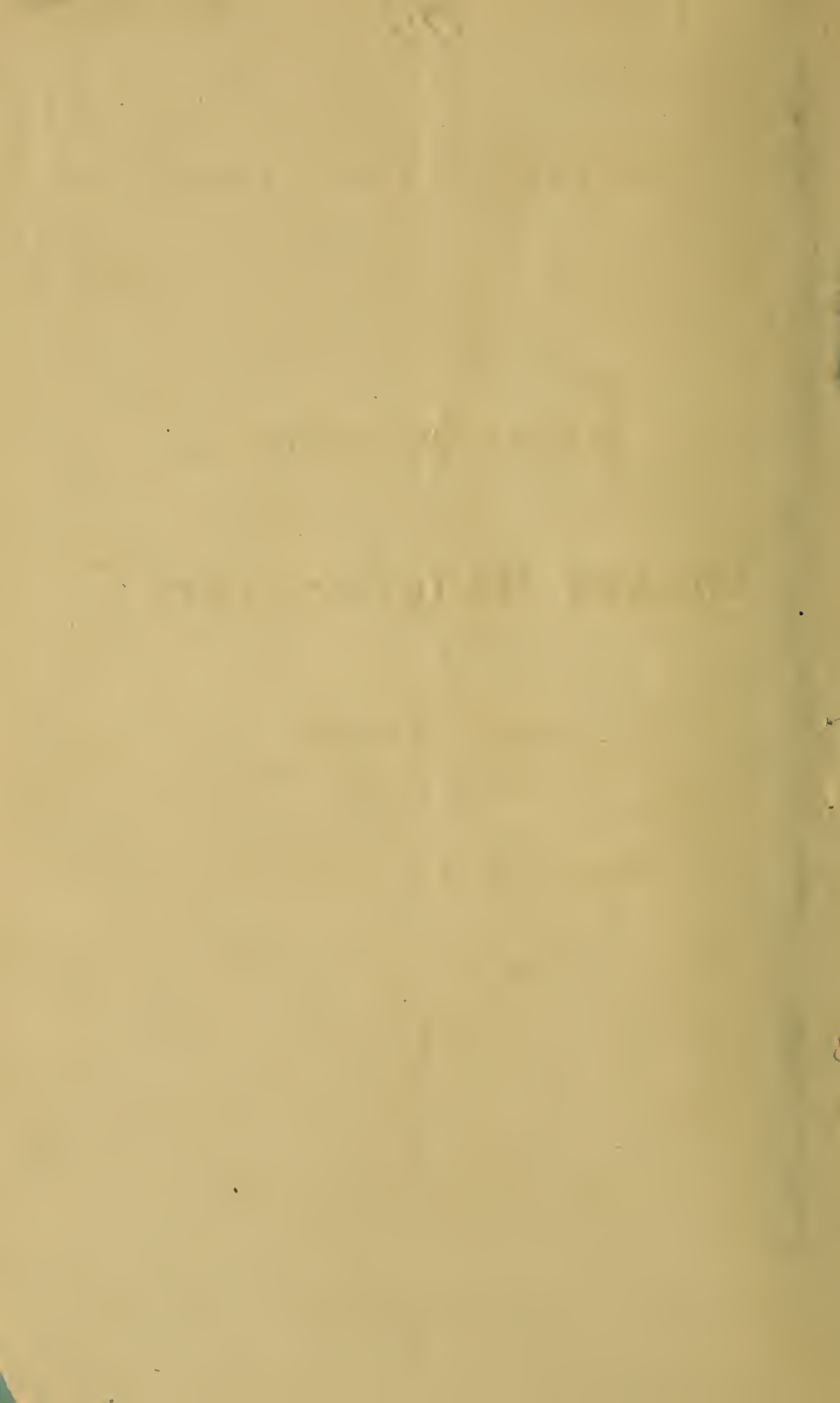
ASSOCIATION

For the Year Ending February 21, 1872.

BARRE :

PRINTED BY J. HENRY GODDARD, GAZETTE OFFICE.

1872.



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SEVENTH ANNUAL REPORT

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MASSACHUSETTS

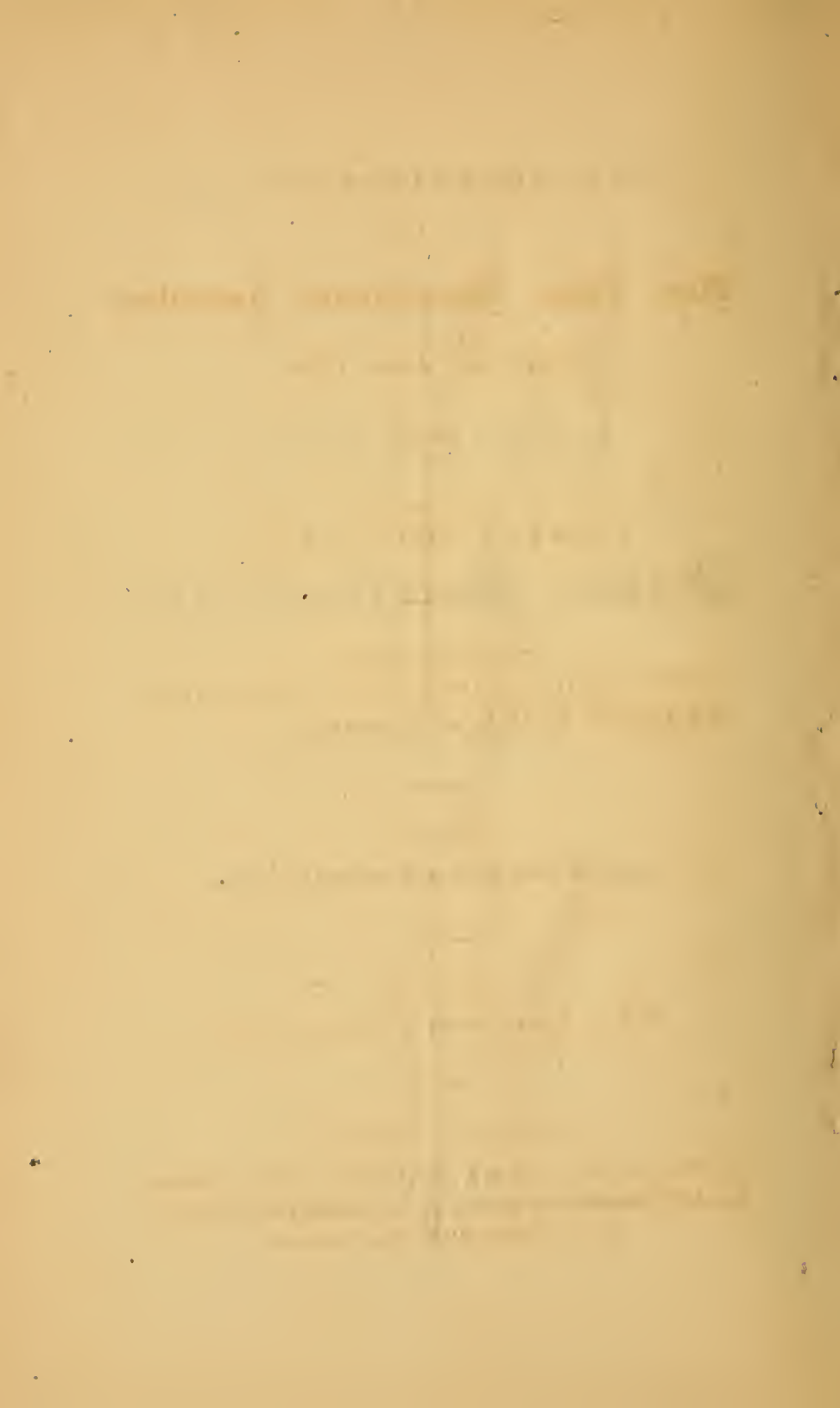
Cheese Manufacturers'

ASSOCIATION

For the Year Ending February 21, 1872.



BARRE :
PRINTED BY J. HENRY GODDARD, GAZETTE OFFICE.
1872.



OFFICERS

OF THE

Mass. Cheese Manufacturers' Association

For the Year 1872.

PRESIDENT:

THOMAS P. ROOT, of Barre.

VICE-PRESIDENTS:

CORTLAND SANDERSON, of Phillipston.

FRAZIER PAIGE, of Hardwick.

SECRETARY:

N. S. HUBBARD, Brimfield.

TREASURER:

B. F. HAMILTON, New Braintree.

EXECUTIVE COMMITTEE:

THOMAS P. ROOT, Barre, FRAZIER PAIGE, Hardwick,

C. SANDERSON, Phillipston, N. S. HUBBARD, Brimfield,

B. F. HAMILTON, New Braintree.

PREAMBLE AND CONSTITUTION.

PREAMBLE.

WHEREAS, It is deemed expedient to organize an Association, through which, as a medium, results of the practical experience of dairymen may be gathered and disseminated to the dairying community, therefore,

Resolved, That we do hereby associate ourselves together for mutual improvement in the art and science of cheese-making, and more efficient action in promoting the general interests of the dairying community.

CONSTITUTION.

ARTICLE I.—The name of the organization shall be the MASSACHUSETTS CHEESE MANUFACTURERS' ASSOCIATION.

ARTICLE II.—The officers of the Association shall consist of a President, two Vice-Presidents, Secretary and Treasurer.

ARTICLE III.—The President, Vice-Presidents, Secretary and Treasurer shall constitute the Executive Board of the Association.

ARTICLE IV.—The officers of the Association shall be elected at the regular annual meeting, and shall retain their offices until their regular successors are chosen.

ARTICLE V.—The regular annual meeting shall occur on the third Wednesday in February of each year, and at such place as the Executive Board shall designate.

ARTICLE VI.—Any person may become a member of the Association, and be entitled to all its benefits, by the payment of one dollar.

REPORT OF SECRETARY.

The Massachusetts Cheese Manufacturers' Association held their Seventh Annual Meeting at New Braintree, Tuesday and Wednesday, Feb. 20th and 21st. The weather was all that could be desired, and at two o'clock P. M. a large number of farmers and others interested in the dairy, and especially in the manufacture and sale of cheese, were assembled in the hall of the hotel, when President Root, of Barre, called the meeting to order, stating the objects and aims of the Association, and in a few well chosen remarks, said that although the season had been unfavorable, and the price of dairy products low, which led some farmers to feel like abandoning dairying, still we would congratulate ourselves on the comparative success of the past season, and the prospect of brighter days for the year to come. In closing he introduced Professor Stockbridge, of the Agricultural College, who discoursed on the "productive power of the soil."

He spoke of the soil as the great reservoir from which every living thing draws sustenance; that plants, animals and soils are made up of the same material. The mode of abstracting the largest amount possible from it, varies in different countries. In England, France and China, nothing is absorbing more attention than the reproduction of the soil. He spoke of France with a less area than Texas exporting large quantities of grain, and that the time will come when the soil here will be taxed to its utmost capacity. At present, New England did not produce enough to support her population.

He said if we follow the teachings of nature, man will not live long enough to exhaust the fertility of the soil. What is this strange material that to-day we tread under our feet, and

to-morrow admire? Every particle of matter ever in existence still exists, and may be used over and over again. Plants are of the same material of the soil, only changed in form, and are again returned for its fertilization. He spoke of water as a great agent in fertility, and that it penetrated almost every substance, and occupied one-eleventh more space when frozen so that it had power to separate and grind the particles of soil and better prepare them for use.

He spoke also of the air as another great agent in fertilization, and that it forces its way into the soil, thereby rendering it more productive. Nature's processes are all enriching, and soil in a state of rest will recuperate and be in a better state of reproduction. The demand for food is greater than the improvement of the soil by nature, so that there is a demand for artificial stimulants. He spoke of drainage, and said that although water was an essential agent in conveying plant food, a superabundance would as effectually drown the soil as it would an animal. That drainage, although it would not remove the entire water, would allow it to breath in the atmosphere and thereby render it more productive. The constant drain upon the soil by plants must be returned by way of manure, and that any substance was a manure that acted upon the soil so as to liberate plant food already existing in it. He closed with an earnest appeal to the farmers to be hopeful for the future and keep up good courage.

After the address, an hour or more was occupied in the discussion of topics contained in the address, and was participated in by Mr. Holland and Dr. Brown, of Barre, Mr. Hyde, of Lee, and others. Mr. Holland thought that manure applied directly to the soil without composting, was of equal value to compost, thereby saving a vast amount of labor, and said also, that the more the soil was stirred, the more productive it would be.

Dr. Brown said he was glad he had come up to this Convention, and that he was more and more interested in agriculture, and should like to be a good farmer. He said he had learned one thing the past year that he had formerly ignored, and that was the raising of roots which he had done this season, and had found them very valuable. In farming, many things were possible that had been thought impossible. The question was

asked, "How can our pasture lands be improved that have deteriorated by continual cropping with no returns?" Prof. Stockbridge said that no formula could be laid down on account of the diversity of the soil. Ashes were used with great success. Also, plaster and a mixture of salt and plaster where soils were not too tenacious. From two to six quarts of bran fed to the cows during the summer was said to carry valuable ingredients to the soil.

Adjourned to seven o'clock P. M. Met according to adjournment and found the hall well filled with ladies and gentlemen to listen to an address by Alexander Hyde, Esq., of Lee, on the chemistry of milk, butter and cheese. He gave much valuable statistical information and spoke of the great value of milk as an article of food, and of the difference of milk from the different breeds of cattle. He said that the Durhams did not give as much in quantity, nor was it as good in quality. The Ayrshires were about an average, but the Jersey milk was rich in cream and very poor after the cream was removed. He spoke of the season of the year and food as affecting the quality of the milk, and that morning's milk was better than night's. He said that cows kindly treated and carefully driven to and from pasture would give more milk, and that cows and women were never made to run or be abused. He spoke of early cut hay as being much better than late, and that all roots increase the flow of milk, and should be fed. Cows crave a variety of food. He spoke of the different ingredients of milk, and said that condensed milk was not equal to it in its original state. He spoke of milk and cheese as an ancient article of diet, and quoted Job where he says, "Hast thou not poured me out milk and curdled me like cheese." Cheese he said was not eaten as much in this country as in Europe but that it was an economical article of food, as one pound was equal to two pounds of beefsteak, and could be produced cheaper.

The address was listened to with marked attention and followed by an essay from T. P. Root, of Barre, on cheese making which contained many valuable suggestions concerning its manufacture and care. He said we should aim at a high standard, and then endeavor to attain to it, which he thought might be done. A cheese he said should be so mild as not to leave a

taste in the mouth, so delicate that it can be eaten by any one, and so full of nutriment that it will be ample food for a strong man. This closed the exercises of Tuesday.

Wednesday the Convention assembled at ten o'clock, but not with any increase of members. The first business was the reading of the report of the doings of last year, by the Secretary, and also the Treasurer's report of the finances. A vote was passed last year asking each factory in the state to contribute one cent on every one hundred pounds of cheese made during the year for the support of the Association. All the factories were invited to contribute and the following have promptly responded, viz: New Braintree, Lenox, Greenfield, Worcester County, Warren Cheese Company, Green Mountain, at Peru, and Mr. Ruggles, of Hardwick, (a private factory).

Reports were presented from ten factories, and one has since come in. There are, and have been in the State, about thirty factories. The first was erected in 1864. Six of these have nearly or quite gone out of sight, viz: Wbraham, Belchertown, West Brookfield, Westborough, Spencer and Byfield. Others have failed to report themselves.

After hearing the reports there was a discussion on the various topics contained in them, and a comparison of notes as to the different breeds of cattle, each having their persistent advocates. It was earnestly urged upon the several factories, the importance of contributing their share for the support of the association.

The following resolutions were unanimously adopted :

Resolved, That the thanks of the Association are due to Prof. Levi Stockbridge and Hon. Alexander Hyde, for their able and interesting addresses.

Resolved, That we tender our thanks to the citizens of New Braintree, for their courtesy and attention.

Resolved, That we express our obligation to the members of the press for the interest manifested in our proceedings.

The subject of making butter and cheese at the same factory was discussed at some length, and at four o'clock the convention separated with the utmost good feeling, hoping for better returns from the dairy the coming season, and more favorable reports at our next annual gathering.

N. S. HUBBARD, SECRETARY.

REPORTS OF FACTORIES.

WORCESTER COUNTY CHEESE FACTORY AT WARREN.

Capital invested, \$5200; began making April 3, closed October 28; 808,859 lbs. milk used; 9.77 lbs milk to one of cured cheese; cheese kept from 30 to 60 days before marketed; weigh 60 to 70 lbs. each, 18 inch hoops; help 2 men and 1 woman 3 months, costing, including board, \$828.30; 250 rennets costing \$50; boxes 30 cents each; 1097 yards cloth used costing \$78.69; steam heated; fuel used, 18 cords wood costing \$72, and coal costing \$15; F. F. Syracuse dairy salt used; cheese cost 2½ cents per lb. to get ready for market; salt used, 2.6 lbs. per 1000 lbs. milk; cheese cured 82,765 lbs.; net income \$10.31 per 100 lbs.; average number of cows for season 300; 275 lbs. cheese per cow.

BARRE CENTRAL CHEESE FACTORY.

Capital invested \$8000; began to make cheese April 10, closed November 12; 1,551,915 lbs. milk used; 9.892 lbs. to one lb. of cured cheese; cheese kept 4 to 6 weeks before being marketed; 22,067 cheeses, 40 to 75 lbs. each in 18 inch hoops; 34 smaller, 10 to 20 lbs. each; help 1 man and 1 woman and 1 woman extra about 3 months, costing, including board, \$1007.33; 404 rennets costing \$101; 1634 boxes costing \$457.52; 1255 yards cloth bandage costing \$106.60; Ralf vat used; 25½ cords wood costing \$131.56; 16 bbls. and 1 sack Syracuse F. F. dairy salt costing \$61.16; total expense per lb. getting cheese ready to send from factory, including boxes, 1.92 cents; expense of freight and marketing \$520.78; 156,800 lbs. cheese cured; net income per 100 lbs. \$10.73; value of 1-5 of whey left at factory \$465.23.

HARDWICK UNION CHEESE FACTORY, GILBERTVILLE.

Capital invested \$3100; began making cheese April 20, closed October 15: 598,721 lbs. milk used, 10.29 milk to 1 of cured cheese; cheese kept from 6 to 8 weeks before being marketed; 1163 cheeses, each 50 lbs. and 18 inches in diameter; help, 1 person at a cost, including board, of \$638.64; 257 rennets costing \$64.25; 938 boxes costing \$281.40; 847½ yards cloth costing \$76.27, half remaining; steam heated; 12 cords wood burnt costing \$7350, and one ton coal, \$11; 6 sacks D salt costing \$19.50; all other expenses, including interest on invested capital, \$241.60; freightage and marketing cost 93.43 cents per 100 lbs.; salt used, 2.8 lbs. per 1000 lbs. milk; 58,129 lbs. cheese cured; net income per 100 lbs. \$9.09.

GREENFIELD CHEESE FACTORY.

Capital invested \$2700; began making April 22, closed September 20; 215,492 lbs. milk produced; 9.74 lbs. of milk to 1 of cured cheese; 535 cheeses, each weighing 40 lbs. 15 inches in diameter; help, 1 man at a cost including board, of \$510; 196 rennets costing \$39.89; boxes 28 cents each; 275 yards of cloth costing \$26.10; Charles Miller & Sons' heater; fuel burned, 6 cords and 98 feet wood costing \$27.66; 3 bags Marshall's salt used, 43 ounces per 1000 lbs. milk; 22,079 lbs. cured cheese, sold at an average of \$13.63 per 100 lbs.

NEW BRAINTREE CHEESE FACTORY.

Capital invested \$9000; began making cheese April 3, closed November 11; 1,679,351 lbs. milk used, being 10.1 to one lb. of cheese cured; cheese kept from 30 to 70 days before marketing; made two sizes, 30 to 40 lbs. and 65 to 70 lbs. each; help equal to 1 man and 2 women all the time, and a second man 3 months, at a cost including board of \$1440.04; used 830 rennets costing \$159.55; 2261 boxes costing \$644.38; 1255 yards of cloth used costing \$139.43; steam heated; 4300 lbs. coal and 30 cords wood costing \$201.97; 4500 lbs. Marshall's salt used costing \$65; total expense per 100 lbs. getting cheese ready to send from factory \$2.13; expense of freight and marketing \$828.13; 2.6 lbs. salt used per 1000 lbs. milk; 165,552 lbs. cheese cured; net income per 100 lbs. \$10.71.

WARREN CHEESE FACTORY.

Two-story building 26x60, with L for boiler, cost \$3000; began May 1, closed September 18; 307,747 lbs. milk produced; 9.76 lbs. milk to one of cured cheese; kept 40 to 60 days before marketing; 470 cheeses each 68 lbs. and 18 inches in diameter; help 1 man, costing one cent per lb. of cheese made; 130 rennets; 200 boxes costing \$60; \$21 worth of cloth used; steam heated; fuel cost 11 cents per 100 lbs. cheese; 5 bbls. Syracuse F. F. salt used costing \$20; total expense per lb. in getting cheese ready to send from factory 1 $\frac{1}{4}$ cents; expense of freight and marketing 30 cents per 100 lbs.; 31,536 lbs. cured cheese; net income \$10.54. Process of making cheese: Milk set at 82 deg. to coagulate in 25 minutes; stand before cutting 30 minutes; cut the curd lengthwise of the vat and across it; stand 30 minutes before heating, then apply the heat and work with the agitator; heat slowly until the temperature is 96 or 98 deg., as the weather may require; remove the curd before the whey changes; salt, 2.7 lbs. to 100 lbs. of milk; curd cooled to 86 deg. before putting in the hoops; stand 30 minutes before pressing; bandage after pressing lightly 30 minutes; press two days and then remove the cheese to the dry room.

BARRE SOUTH CHEESE FACTORY.

Amount of capital invested \$4600; commenced making April 17, closed October 1; 733,924 lbs. of milk produced; 10.5 lbs. milk to 1 of cured cheese; cheese kept from 30 to 40 days before marketing; average weight of cheeses about 55. lbs.; help, 1 man 5 $\frac{1}{2}$ months, 1 man 3 $\frac{3}{4}$ months; cost of help, including board \$607.35; 1100 boxes costing 27 cents each; \$40 worth of cloth used; Ralf vat used; cost of fuel \$60; 4 bbls. and 4 sacks F. F. dairy salt costing \$36; total expense per lb. in getting cheese ready to send from factory 1.9 cents; expense of freight and marketing 61 cents 100 per lbs.; 43 ounces of salt used to 1000 lbs. of milk; 69,770 lbs. cured cheese; net income per 100 lbs. \$10.37; whey taken by milk contributors; 300 lbs. butter made from cream.

GREEN MOUNTAIN CHEESE FACTORY, PERU, BERKSHIRE CO.

Building 36x64 feet, attachment for press room 14x20; complete cost of building with apparatus \$2500; began operations May 15, closed September 29; length of time in operation (not open on Sundays) 94 days; 496,230 lbs. milk used; 50,124 lbs. cured cheese; 57,141 lbs. green cheese; 9.9 lbs of milk to 1 of cured cheese; 8.68 lbs of milk to one of green cheese; number of cows 260; greatest yield of milk, June 22d, 5417 lbs, smallest yield, May 17th, 2756 lbs; average per cow for season 190-858 lbs.; average per day to each cow 20.303 lbs.; greatest average per cow to Eli Sennet, smallest to Thomas Torrey; cost of getting cheese ready for market \$2.50 per 100 lbs.; average price sold for per lb. 12½ cents; weight 60 lbs. each, 15 inches in diameter; boxes cost \$30; A. G. Bagg's patent heater used; 24 lbs. salt to 1000 lbs. milk.

HARDWICK CENTRE CHEESE FACTORY.

Capital invested \$4280.50; began to make cheese March 6, closed November 9; 1,578,299 lbs. milk used; 9.75 lbs. milk used to 1 lb. of cured cheese; cheese kept six weeks before being marketed; 2413 cheeses made; help, 2 men and 1 woman costing \$1275.75 including board; 753 rennets costing \$130; 2351 boxes costing \$705.60; 1152 yards cloth used; Ralf vat used; fuel cost \$114; F. F. dairy salt, New York mills, 19 bbls. costing \$58.50; expense per lb. of getting cheese ready to send from factory 1.75 cents; expense of freight and marketing 4-5 cent per lb.; 160,752 lbs cheese cured; net income per 100 lbs. \$10.52.

LENOX CHEESE FACTORY.

Capital invested \$3000; began to make May 1, closed October 14; 228,403 lbs. milk used; 10.4 lbs. to 1 of cheese cured; cheese mostly sold in September; average weight 55 lbs. each; help, 1 man, costing with board, \$478; rennets cost \$10; 310 boxes costing \$62; Ralf vat used; fuel, 6 cords of alder wood, costing \$18; Ashton's salt used; total expense per lb. getting cheese ready to send from factory 2½ cents; 21,767 lbs. cured cheese; net income per 100 lbs. \$10.05.

PETERSHAM CHEESE FACTORY.

Commenced making cheese May 15, closed September 13; 257,351 lbs. of milk used; weight of cheeses 40 to 50 lbs.; cost of help, including board \$358; total expense per lb. in getting cheese ready to send from the factory 3.41 cents; amount of cheese cured 25,735; net income per 100 lbs \$8.41; 10 lbs. milk to 1 of cheese.

GREYLOCK CHEESE FACTORY, SOUTH ADAMS.

Commenced making cheese April 15, closed December 1; 821,381 lbs. milk produced; 9.8 lbs. milk to one of cured cheese; cheese kept 60 days before marketing; 1300 cheeses, weight 70 lbs. each; help, 1 man; 4000 lbs. cured cheese; net income per 100 lbs. \$13.46; number of cows 220; cheese per cow 400 lbs.

COY'S HILL CHEESE FACTORY, WARREN.

Capital invested \$6000; began making cheese March 20, closed September 27; 955,777 lbs. milk used; 9.75 lbs milk to 1 of cured cheese; cheese kept before marketing 40 to 60 days; average weight about 50 lbs. each, 15 inch hoops; help, 1 man through the season, and 1 man and girl 3 months, costing including board, 85 cents per 100 lbs. of cheese including rennets and wood; 1931 boxes, cost \$499.11; 1017 yards cloth costing $8\frac{1}{2}$ cents per yard; Miller's circulating coil cheese vat used; 13 sacks Worthington salt used, costing \$2.75 per sack; total expense per lb. getting cheese ready to send from factory, including freight and marketing 24 cents per lb.; 98,067 lbs. cheese cured; net income per 100 lbs. \$9.92 $\frac{1}{2}$.

LIST OF MEMBERS.

BARRE.

Peter Harwood,
W. R. Barrett,
T. P. Root,
C. A. Merriam,
James F. Davis,
Miletus Henry,
John T. Elsworth,
Francis D. Rice,
Daniel G. Harwood,
Wilcut Harwood,
Clarke Jamerson,
Edmund W. Allen,
Nathan'l E. Holland,
Hiram Wadsworth,
Edwin Woods,
Loring F. Woods,
John E. Henry,
*Chas. M. Spooner,
Job Stetson,
Henry E. Rice,
John W. Rice,
John F. Woods,
Joseph Robinson,
Joel B. Hinckley,
Henry M. Cutler,
J. Henry Goddard,
Emery A. Howe,
Austin Hawes,
A. H. Holland,
Albert S. Holland,
Pliny H. Babbitt,
*Israel Fisher,
George Brown,
Benjamin Upton,
Cyrus Atwood,
Franklin Babbitt,

*Deceased.

Justin Reynolds,
Harding Woods,
James W. Jenkins,
Estes Hawes,
Edwin R. Bemis,
Franklin Smith,
Oramel Clark,
Nelson Loring,
E. H. Egery,
E. B. Shattuck,
David Fay,
James N. Patterson,
L. F. Billings,
George H. Lane,
S. S. Hamilton,
Isaac Smith,
Simpson E. Bates,
Abner R. Mott,
W. A. Tolman,
Marshal D. Eaton,
J. F. Washburn,
Mrs. J. T. Ellsworth,
" J. H. Goddard,
" Peter Harwood,
" F. D. Rice,
" Miletus Henry,
" D. G. Harwood.

BRIMFIELD.

N. S. Hubbard,
G. F. Brown,
Calvin Baker,
Sumner Parker,
*Alured Homer.

PHILLIPSTON.

Cortland Sanderson,
James W. Hagar.

HARDWICK.

J. W. Powers,
J. M. Robinson,
B. W. Sherman,
Elijah C. Newton,
J. C. Paige,
Elbridge Ruggles,
W. A. Warner, Jr.,
Charles A. Wheeler,
Charles Ruggles,
John B. Aikin,
S. P. Hillman,
John A. Newcomb,
Wilder U. Barnes,
George Manley,
F. D. Ruggles,
Frazier Paige,
J. W. Paige,
C. Southworth,
F. B. Aiken,
George Warner,
Bela B. Paige,
Dwight Billings,
John Paige,
Simon Stockwell,
C. L. Warner,
Calvin W. Mann,
Moses Ruggles,
S. S. Dennis,
W. F. Slany,
C. S. Clark.

LEE.

Alexander Hyde.

UTICA, N. Y.

Charles Miller.

NEW BRAINTREE.

*Hollis Tidd,
William A. Mixter,
Josiah P. Gleason,
Josiah Bush,
B. F. Hamilton,
J. M. Green,
Moses H. Fay,
Moses Pollard,
D. G. Barr,
H. A. Hoyt,
W. A. Wheeler.
Elbridge Gleason,
Charles A. Gleason,
Charles Wilcox,
Jonathan Bush,
Edwin Hoar,
H. L. Pollard,
Edwin W. Barr,
George K. Tufts.

PETERSHAM.

Lewis Sanderson,
Merrick Blanchard,
George Brvant,
Jarius Williams,
Silas Wheeler,
Henry S. Miner,
D. C. Paige,
Mrs. H. S. Miner.

WORCESTER.

Draper Ruggles.

NORTH BROOKFIELD.

W. H. Ayers,
J. C. Ayers,
Royal Pickard,
D. W. R. Hinckley,
C. T. Huntington.

GREENWICH VILLAGE.

J. H. Walker.

ENFIELD.

William B. Kimball.

BOSTON.

C. L. Flint,
L. Wetherill,
Dr. J. R. Nichols.

WARREN.

Dwight Ellis,
D. S. Ellis,
Samuel L. Fisk,
D. W. Shepard,
J. E. Patrick,
Marcus Burroughs,
D. R. Tyler,
D. E. Young,
S. N. Gleason,
John Bridges,
Giles Blodgett.
T. H. Jones,
C. H. Shepard,
R. H. Blair,
W. S. Gilbert,
W. A. Patrick,
S. R. Burroughs,
C. H. Ellis,
E. A. Day,
C. C. Bliss,
Calvin Cutter,
D. M. Gould.

WESTBORO'.

Lyman Belknap.

CONCORD.

Simon Brown.

SALEM.

Dr. Geo. B. Loring.

WARE VILLAGE.

B. Bond.

WILBRAHAM.

D. B. Merrick,

Henry Dewey.

SOUTH ADAMS.

S. L. Lincoln,
A. J. Bucklin.

WEST BROOKFIELD.

E. F. Henshaw,
E. Fairbanks,
J. G. Bruce,
W. B. Stone,
G. A. Barnes,
F. M. Carew,
J. W. Bailey,
L. H. Chamberlain,
Z. E. Cary,
Manley Pierce,
A. W. Smith,
Josiah Henshaw,
Oliver F. Davis,
William Adams, Jr.

HUBBARDSTON.

Andrew Gleason,
Danforth Clark.

DANA.

N. L. Johnson.

PERU.

M. Pierce.

SHERBURNE.

Andrew Hunt.

BLANDFORD.

W. E. Boise,
E. W. Boise.

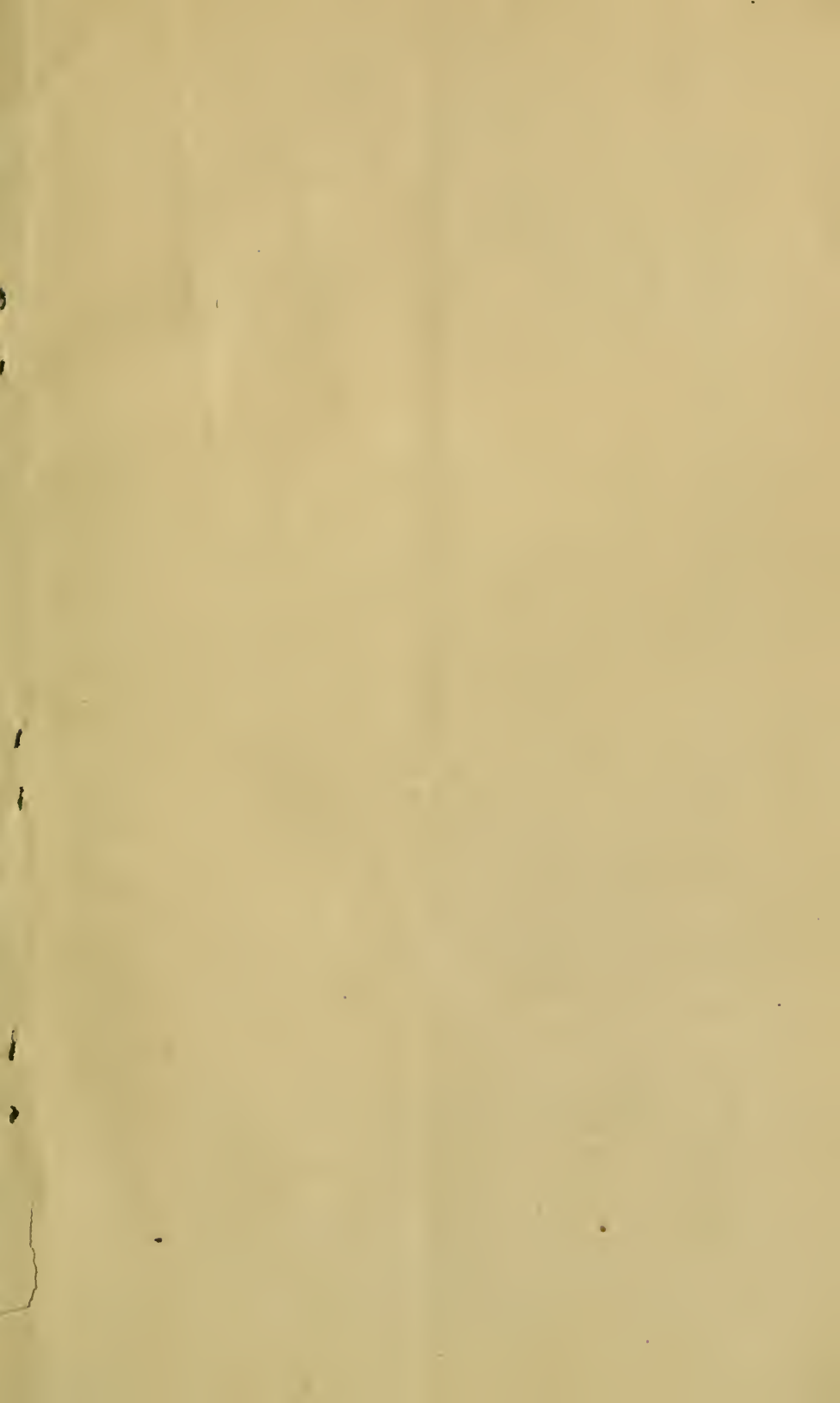
LENOX.

Richard Goodman.

OAKHAM.

Cheney R. Adams,
Alonzo Lincoln,
Charles M. Packard.







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